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BLUE JAY

June 1987

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Cover: Burrowing Owl. Gary Seib.

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Young Burrowing Owls *R.E. Gehlert*

EFFECTS OF SOME INSECTICIDES ON PRODUCTIVITY OF BURROWING OWLS

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Introduction

Damage to grassland by grasshoppers in western Canada has been noted ever since the days of the early explorers. These insects can cause significant losses of cereal and forage crops; this has led to heavy reliance on chemical control to reduce grasshopper damage. The magnitude of current chemical use is illustrated by the fact that an estimated 7 - 8 million acres were sprayed for grasshopper control in Saskatchewan alone in 1986 (L. Harris, Sask. Agriculture).

The Burrowing Owl has been designated a threatened species in Canada by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). Two-thirds of the Canadian population may breed in Saskatchewan. Although a progressive decline in numbers has been described in recent decades, the causes remain to be determined.[9] Haug found that insects comprised 93% of the 1,842 prey items identified at Saskatchewan nest sites in 1982 and 1983; grasshoppers accounted for 75% of these insects.[6] Grasshoppers make up about 70% of the total diet of these birds. In Haug's study, 60% of flights from the nest burrow were within 50 m and 90% were within 400 m.[6]

In 1986 a pilot study was carried out to determine the impact of grasshopper spraying on the reproductive success of Burrowing Owls in Saskatchewan.

Study area and Methods

To determine the effects of chemical grasshopper control the following study was designed. Study areas were selected using the predicted intensity of grasshopper infestation and known Burrowing Owl density. Within these study areas, active nest burrows were located. Reproductive performance was monitored and the history of insecticide application obtained from the land manager and rural municipalities. The treatment groups were then chosen a posteriori based upon the relative number of burrows which were exposed to the various insecticides. Although six insecticides were used, a sufficient number of burrows for statistical analysis was available only for carbaryl and carbofuran treated sites.

The choice of study areas was determined by two factors:

(1) the density of nesting Burrowing Owls within the area had to be high enough to generate a satisfactory sample size with minimal travel
(2) the expected grasshopper infestation had to guarantee that spraying would occur.

Two areas were selected

(1) the heavily cultivated area surrounding Regina, an area expected to have moderate to very severe grasshopper infestation
(2) an area comprised predominantly of rangeland, near Val Marie which was predicted to have a moderate infestation.

In these study areas, active Burrowing Owl nests were located during late May and early June 1986. Repeated visits were made to count the number of young visible above ground. Young were captured, banded, weighed and measured.

Landowners and land managers provided details of grasshopper spraying including the date, location, and chemical applied. Any spraying that occurred within 400 m of an active nest burrow was regarded as a potential exposure (from the findings of Haug[6]).

The statistical probablilites of differences observed between nests treated with carbaryl and/or carbofuran and those not receiving any chemical exposure were determined using a permutation test.[2] All possible pairwise comparisons among the treatment groups were permuted 1000 times and the proportion of times the permuted data gave a difference as extreme as the observed difference provided a measure of significance. Since nest burrows were clustered on a number of different farms, a "farm effect" was allowed for in all analyses by permuting the farm totals rather than the values for the individual burrows. Since no "farm effect" was detected for any parameter, its inclusion means that this analysis is highly conservative.

Results

The details of insecticide exposure on the two study areas are summarized in Table 1. Only 23 of the 99 nesting pairs located on the two study areas were not subjected to at least one spray event within 400 m of their nest burrow in 1986. Seventy percent of all exposures were within 50 m of the nest burrow. Forty-nine percent of burrows were exposed on more than one occasion. Of the 64 burrows studied near Regina, 97% were exposed at least once within 400 m, in marked contrast to only 40% of the 35 burrows studied in the Val Marie area. Three roadside applications by municipalities in the Regina area exposed a total of 48 burrows (77% of the total exposed) on 15 farms. Similarly, two roadside applications by municipalities in the Val Marie area ex-

Table 1. DETAILS OF INSECTICIDE SPRAYING IN TWO BURROWING OWL STUDY AREAS, 1986

	Farmland (Regina)		Grassland (Val Marie)	
	No.	%	No.	%
Total Nests Studied	64		35	
Young observed at Nest	50	78	11	31
Not sprayed within 400 m	2	3	21	60
Sprayed within 50 m	49	77	4	11
Sprayed within 400 m	62	97	14	40
Sprayed two or more times	49	77	0	0
Sprays before young seen	145	94	9	82
Sprays after young seen	10		2	

Table 2. IMPACT OF CARBOFURAN AND CARBARYL GRASSHOPPER SPRAYS ON BURROWING OWL REPRODUCTIVE SUCCESS.

Number of nests is given in parentheses.

	Proportion of pairs raising at least one young	Maximum number of young observed per nest
No insecticide exposure within 400 m of burrow	74 % (23)	3.78 (23)
Exposed to carbaryl within 400 m of burrow	77 % (30)	3.82 (28)
Exposed to both carbaryl and carbofuran within 400 m of burrow	50 % (18)	2.44 (18)
Not exposed to either carbaryl or carbofuran	76 % (50)	3.80 (50)
Exposed to carbaryl within 50 m of burrow	77 % (30)	3.30 (30)
Exposed to carbofuran within 50 m of burrow	38 % (13)[a b]	1.77 (13)[c d]

a = P = 0.041 when compared with not exposed
b = P = 0.092 when compared with carbaryl
c = P = 0.025 when compared with not exposed
d = P = 0.097 when compared with carbaryl

posed 12 burrows (86] on 4 properties. Of the 61 exposed burrows at which young were observed above ground on one or more visits, 82% were only exposed before the young were first observed. Thirteen exposure events occurred before the young were observed above ground for every one occurring after.

Six different insecticides were applied within 400 m of one or more nest burrows. Carbofuran (Furadan), carbaryl (Sevin), and chlorpyrifos (Lorsban) accounted for 35%, 35%, and 15% of the applications, respectively. The other insecticides used were deltamethrin, malathion and methamidophos. The mechanism of toxic action of these agents, with the exception of deltamethrin, is the inhibition of the enzyme acetylcholinesterase, normal activity of which is essential for normal nervous system function in insects, birds and mammals.

The productivity of pairs exposed to carbaryl and/or carbofuran is summarized in Table 2. One or more exposures to carbaryl within 50 or 400 m of the nest burrow had little effect on productivity. In marked contrast, exposure to carbofuran within 50 m of the nest burrow was associated with a 54% reduction in the number of young per nest (P 0.05) and a 50% reduction in the proportion of pairs that raised one or more young (P 0.05) relative to the 50 m control. Since no pairs were exposed to carbofuran alone within 400 m, the productivity of those exposed to both carbaryl and carbofuran was compared to those exposed only to carbaryl. The productivity of pairs exposed to both agents was 35-36% lower than those exposed to carbaryl alone (P 0.10).

The hazard posed by direct spraying of nest burrows is illustrated by a comparison of the reproductive performance of owls nesting in three pastures near Regina (Table 3). One pasture containing 5 active nests was sprayed aerially on 17 June with carbofuran, another containing 10 active nests was aerially sprayed with carbaryl, while another containing 14 active nests was not sprayed with any agent. No young or adults were ever seen above ground on seven successive site visits over a period of four weeks after the burrows were sprayed with carbofuran. Some of these adults may have perished since the usual behavior of adults after nest failure is to remain at or near the nest site. All five burrows sprayed with carbofuran were ex-

Table 3. REPRODUCTIVE SUCCESS OF BURROWING OWLS IN THREE PASTURES NEAR REGINA

	Carbofuran*	Carbaryl*	None
Number of active nest burrows at time of spraying	5	10	14
Proportion of nests producing one or more young	0%[a,b]	70%	93%
Max. number of young per nesting attempt	0[c]	2.9[d]	4.3

* Aerially sprayed with insecticide. Values given are means.
a = P 0.005 when compared with no spray, Fisher's Exact Test
b = P 0.025 when compared with carbaryl, Fisher's Exact Test
c = P 0.001 when compared with no spray, Mann-Whitney Statistic
d = P 0.05 when compared with no spray, Mann-Whitney Statistic

cavated between 4 and 16 July 4. A single adult was captured in each of three burrows, an intact egg and eggshells were found in another, and the remains of small chicks were found in another which had been previously dug up by a fox. Affected adults may have sought shelter in other unoccupied burrows and died there. If they died outside the burrow it is likely the carcasses would disappear rapidly.[1]

Conclusions and Recommendations

In areas and years of moderate to severe grasshopper infestation, Burrowing Owls nesting in Saskatchewan are frequently exposed to insecticidal agents. It is apparent that some of these agents have a greater impact on reproduction than others. There was a difference in the frequency of exposure between the two study areas which was consistent both with the severity of the predicted infestation and the greater crop area at risk to grasshopper damage in the Regina study area.

The relative toxicity to birds of insecticides currently registered for grasshopper control is shown in Table 4. Although these agents are roughly equivalent in effectiveness at the labelled application rates, their toxicities to the Mallard (one of the few species in which all these chemicals have been tested) vary greatly; carbofuran is 10,000 times more toxic than deltamethrin. We do not know the sensitivity of the Burrowing Owl relative to the Mallard.

Since the various insecticides applied are roughly equal in their effectiveness, differences in reduction of owl food between agents is not expected. The effects on productivity observed with carbofuran suggest that these impacts are not the result of reduction of the food supply, but that this insecticide is particularly toxic to Burrowing Owls. This is further substantiated by the marked difference in impact between the combination of carbaryl and

Table 4. RELATIVE AVIAN TOXICITY OF CHEMICALS REGISTERED FOR GRASSHOPPER CONTROL IN 1986. Agents are listed in order of decreasing toxicity, based on data for the Mallard.

Active Ingredient		Commercial Product At Recommended Application Rates	
	LD 50* mg/kg b.w.	LD 50 Units/Acre	Minimum Cost/Acre Canadian $$**
Carbofuran	0.5	106,000	$2.45
Methamidophos	8	27,625	$4.71
Dimethoate	50	1,728 - 3,940	$1.90
Chlorpyrifos	75	1,467 - 2,240	$3.29
Azinphos-methyl	136	441 - 1,185	$2.58
Malathion	1487	230	$4.31
Carbaryl	2564	88 - 203	$4.23
Deltamethrin	4640	0.6	$2.94

*. = Toxicity of active ingredient for the Mallard; for example 50% of the Mallards eating 0.5 milligrams of carbofuran for each kilogram of their own body weight have been found to die in laboratory experiments — LD50 is the lethal dose for 50% of the population.

** Product costs (in 1985) and toxicity of commercial product at recommended application rates derived from figures presented in "Grasshopper Forecast in Saskatchewan - 1986" (Sask. Agriculture, Regina) carbofuran relative to that of carbaryl alone. The increased impact with carbofuran exposures at 0 and 50 m relative to those at 400 m suggests an increasing hazard with proximity of the application to the burrow.

The majority of insecticides were applied between 10 and 30 June while the female Burrowing Owls were incubating eggs or brooding small young. The carbofuran-associated impacts are therefore thought to be the result of alterations in parental behavior. Laughing Gulls dosed with parathion spent significantly less time incubating in the 72 hours following dosing than did gulls dosed with corn oil.[10] Female European Starlings exposed to sufficient organophosphate insecticide to reduce the activity of the brain enzyme cholinesterase by 50% made significantly fewer sorties to feed their young and were away from their nest boxes for longer periods of time than were controls.[5] Their nestlings also lost significantly more weight. These experimental studies suggest that cholinesterase-inhibiting insecticides can alter amount of time spent incubating the eggs or brooding and/or feeding the chicks. The chicks may also be poisoned by insecticide-contaminated food provided by the adults.

The total net economic benefit accruing to Saskatchewan wheat growers from chemical grasshopper control over the period 1980 to 1985 has been estimated at $161 million.[7] Despite their extensive use, insecticides have not reduced the frequency or intensity of regional grasshopper infestations; they have merely conferred a measure of crop protection or salvage.[8] [4] Weather, parasites, disease, and natural predators have been the primary instruments reducing populations. While it is known that Burrowing Owls and numerous other birds consume large numbers of grasshoppers and other insect pests, the contribution of birds, relative to other controlling factors is not known. Nevertheless, it would benefit the farmer to apply those insecticides with the lowest avian toxicity, thereby protecting his crop while minimizing undesireable impacts on local birds that help the farmer by eating grasshoppers.

Our carbaryl and carbofuran findings suggest that the relative impact on reproductive success of Burrowing Owls reflects the acute toxicity of the principal insecticides available for grasshopper control as judged by the LD50 for Mallards (the lethal dose for 50% of the population). If so, then highly toxic agents such as carbofuran should not be applied

Burrowing Owl *Wayne Lynch*

within 400 m of active Burrowing Owl nests. Active Burrowing Owl nests should not be directly sprayed with any insecticide. The relative toxicity to beneficial birds should also be taken into consideration by government agencies when recommending insecticides for grasshopper control and in choosing those for which the cost is to be subsidized. Similarly, municipalities (responsible for exposure of over 75% of the burrows in both study areas) should choose insecticides with the lowest toxicity to nontarget organisms for roadside and other applications. Finally, since 87% of the known Burrowing Owl nesting sites in Saskatchewan are on private land,[3] it is vitally important that land owners and land managers are made aware of the hazards insecticides pose to this bird. The Burrowing Owl is designated as a threatened species, and the Canadian population is a significant component of the continental population. Since the Burrowing Owl is predominantly a bird of the grasslands, its distribution is very similar to that of grasshoppers and grain farms. As long as chemical agents are used for grasshopper control, there is potential for Burrowing Owls to be exposed.

Acknowledgments

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SNHS SANCTUARIES

STAN SHADICK, 3F - 1800 Main Street, Saskatoon, Saskatchewan. S7H 4B3

The centennial of the Last Mountain Lake Bird Sanctuary occurs on 8 June 1987. This event has prompted Canadian naturalists to focus on 1987 as the Centennial of wildlife conservation.

Although the Last Mountain Lake Sanctuary is now famous across Canada, few people are aware of two other sanctuaries in Saskatchewan, namely the Maurice Street Sanctuary near Nipawin and the Prairie Dog Sanctuary near Val Marie. Both of these sanctuaries were established and are currently leased by the Saskatchewan Natural History Society (SNHS).

Maurice Street Wildlife Sanctuary

Maurice Street was a keen bird watcher who lived in Nipawin and co-authored the SNHS Special Publication *The birds of the Saskatchewan River* (1959). As a memorial to Maurice Street the SNHS leased a half-section to be maintained as a wildlife sanctuary.[1] The sanctuary is located on the banks of the Saskatchewan River northeast of Nipawin. It contains all of the portion of Section 1-52-14-W2 which lies to the east of the Saskatchewan River and all that portion of the south half of Section 12-52-14-W2 which lies to the south of the Saskatchewan.[2]

The sanctuary lands are heavily wooded with Jack Pine but a wide variety of other habitats are found nearby. Unfortunately there are no known published bird, mammal or flora lists for this sanctuary. (A regional list of 103 bird species was identified during the 1968 SNHS Summer Meat and was published in the SNHS Newsletter #20, August 1968.[5])

As the 21-year lease on this property apparently comes up for renewal next year the SNHS executive will need to consider future plans for this sanctuary. Individual SNHS members could help by visiting the sanctuary this summer and reporting their observations and comments to the author or any member of the executive. If we neglect this sanctuary we may lose the right to renew its lease.

The road to the sanctuary is marked by a sign on Highway 55 east of Nipawin. The route to the sanctuary over gravel and dirt roads is shown on the map. Be sure to bring insect repellent.

Prairie Dog Sanctuary

In 1965 The Saskatchewan Natural History Society acquired the lease to a quarter section (NE 23-2-13-W3) in the Frenchman River Valley se of Val Marie. This sanctuary was estabished to protect a colony of 400 Black-tailed Prairie Dogs, one of the last large prairie dog towns in Canada.[4] On 14 June 1969 a cairn was dedicated on the occasion of the SNHS Summer Meet held there.[3]

Visitors arriving at the site should remain in their vehicle in order to obtain the best view of the prairie dogs. When one leaves the vehicle the prairie dogs quickly hide underground.

In addition to prairie dogs, visitors should look for Richardson's Ground Squirrels and possibly rattlesnakes or antelope. Some of the birds that may be seen in the area include Horned Lark, Western Meadowlark, Long-billed Curlew, Burrowing Owl, Ferruginous and Swainson's hawks, Golden Eagle, Prairie Falcon and Killdeer. There is also a published sighting by B. Peart and J.G. Woods of eight Mountain Plover seen 22 September 1977; this is an extremely rare species in Canada.[6]

The access to the sanctuary is over a 2-mile dirt trail which starts west of the Kornfield ranch south of Val Marie. This trail should only be used when dry. If you should arrive after a recent rain it is recommended that you visit one of the other prairie dog towns marked on the map which are accessible from a gravel road.

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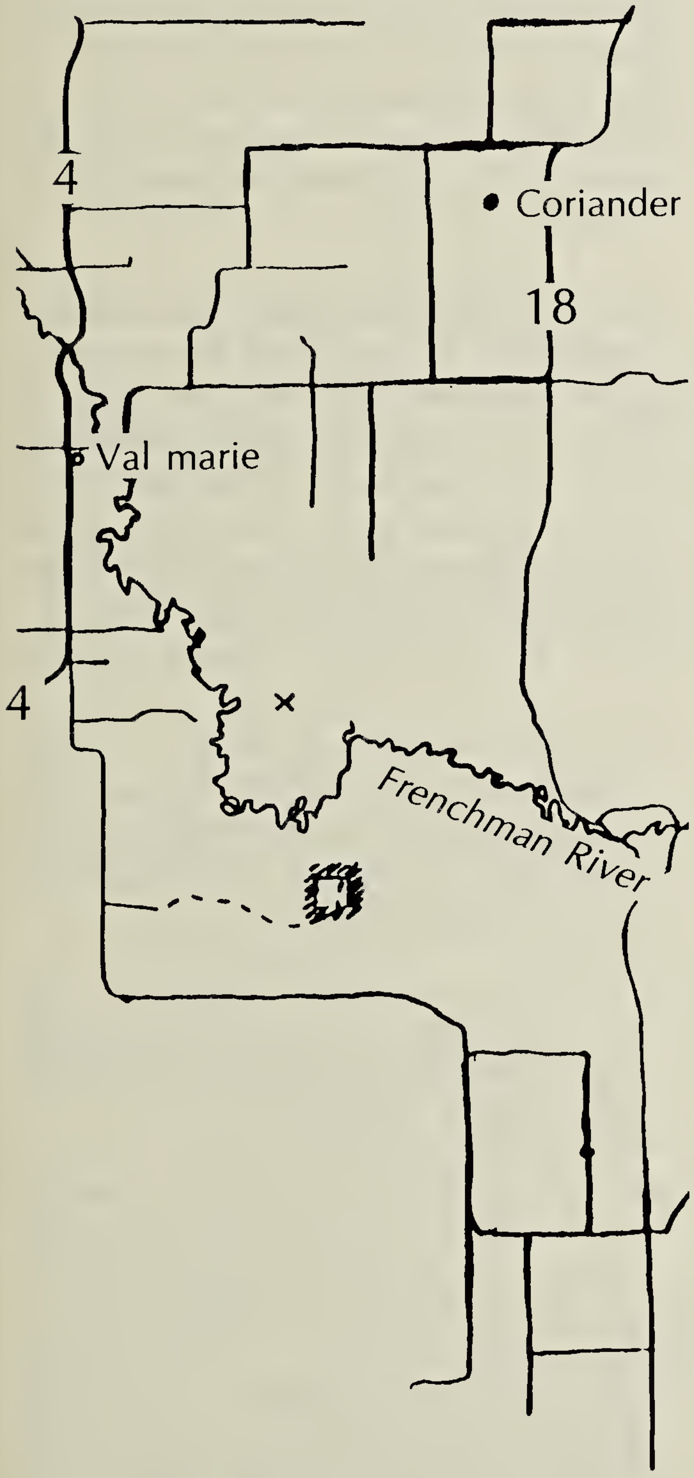
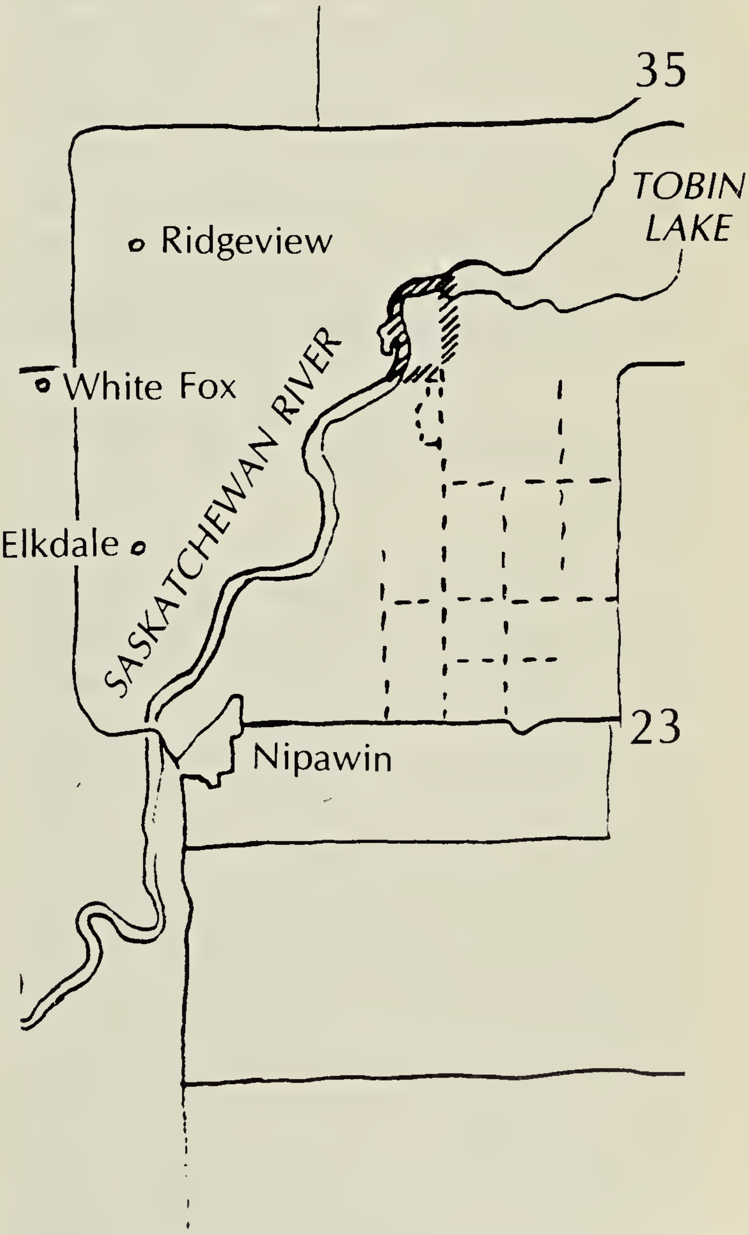
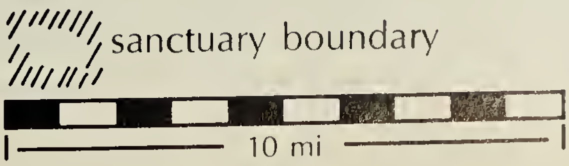


Prairie Dog Sanctuary.



Maurice Street Sanctuary.



THE ROCHE PERCEE-PINTO AREA, SOURIS RIVER VALLEY: A CENTER OF PROVINCIALLY RARE PLANTS

VERNON L. HARMS, W.P. Fraser Herbarium, University of Saskatchewan, Saskatoon, Saskatchewan. S7N 0W0

The Souris River Valley lies in southeastern Saskatchewan where many plant species reach their northwestern range limits. It is on the edge of the Tall Grass Prairie and its riverine deciduous woods tend to have floristic affinities with those farther south and southeast. Thus it is a floristically rich and unique region of the province, with a total of 34 plant species recorded there that are listed as rare for Saskatchewan.[11] Of the latter, 14 are known only from this river valley (or also from the Antler River valley) in the province. Various collectors have contributed to our knowledge of the plant rarities of the Souris River valley, the most notable being Bernard Boivin and John H. Hudson.

In southeastern Saskatchewan during the summer of 1986, many of the earlier collection sites were relocated and some new localities found for botanical rarities in the general Estevan to Pinto-Hirsch region of the Souris River valley. The Estevan area has already been recognized as a center of provincially rare plants, with 22 such species recorded from a 7-mile stretch of the Souris River valley centered on the town of Estevan.[11] During 1986 most locations at which rare plants had been found were revisited in the Estevan area and some new stations recorded for many of the species. But the most rewarding result of 1986 botanical explorations along the Souris River was the finding of a significant number of botanical rarities also in the Roche Percee-Pinto area (totalling 21 rare species, combining new collection records with verified earlier reports). The expectation that the Roche Percee-Pinto area supports populations of many of the same botanical rarities found in the Estevan area was confirmed. Although not all of the species reaching their eastern and western limits in the Estevan area were located in the Pinto-Hirsch area, some additional ones of eastern affinities were included.

Earlier collection records of provincially rare plants in the Roche Percee-Pinto area include the following ten species (listed in chronological order of collection) [Please note that some of the land locations noted hereafter may deviate from the standard quarter section-township-range-meridian by having the designation e - east, ec -east central or wc - west central]:

White Milkwort (*Polygala alba*) — "top of sandstone cliffs bordering the valley of the Souris River" at Roche Percee (17 July 1951, B. Boivin & W.G. Dore; 8022, DAO & SASK).

Switch Grass (*Panicum virgatum*) — top of cliffs bordering Souris River valley, Roche Percee (July 1951, W.G. Dore & B. Boivin; 13309, DAO).

Blue Vervain (*Verbena hastata*) — "small bog at foot of cliff. . . Souris River valley," Roche Percee (July 1951, B. Boivin & W.G. Dore; 8000, DAO)

— "moist ground between. . . brush and boggy ravine bottom", 3 mi. e. of Roche Percee (nw 27-01-06-W2) (17 August 1971, J.H. Hudson; 2750, SASK).

Common Milkweed (*Asclepias syriaca*) — "river valley" at Roche Percee (1954, Harold Longney; *s.n.*, SASK).

To date this is the only record reported of this species in Saskatchewan.

Smooth Cliffbrake (*Pellaea glabella* var. *occidentalis*) — crevices of rock outcrops on s-facing slopes of Souris Valley at Roche Percee (31 May 1958, B. Bovin & J.M. Perron, 11820, DAO & SASK).

Blue Skullcap (*Scutellaria lateriflora*) — "moist shady muddy bank of creek", 3 mi. e. of Roche Percee (nw 27-01-06-W2, 17 August 1971, J.H. Hudson; 2751, SASK).

White-flowered Parsley (*Lomatium orientale*) — a "prairie bench above Souris valley", about 0.25 mi. n. of Pinto (nw 25-01-06-W2, 8 May 1971, J.H. Hudson; 2702, SASK)

Nanny-berry (*Viburnum lentago*) — "base of n-facing wooded slope . . . in ravine" about 0.5 mi. s of Pinto (sw 25-01-06-W2, 6 June 1978, J.H. Hudson; 3516, SASK).[9]

Tomentose Pussytoes (*Antennaria neodioica*) — "moist wash slope at foot of bedrock outcrop" near Pinto (sw 25-01-06-W2, 6 June 1978, J.H. Hudson; 3519, SASK).[4]

Flat-stemmed Spike-rush (*Eleocharis compressa*) — "slightly seepy ground at foot of ravine cutbank" near Pinto (se 26-01-06-W2, 6 June 1978, J.H. Hudson; 3518, SASK).

The collection sites of these rare plants were visited to confirm their continued presence and additional sites in the region were found for most of them. Only Common Milkweed, Smooth Cliff-brake, and Flat-stemmed Spike-rush could not be located in 1986. Eleven other provincially rare plant species were found for a total of 21 now recorded for the Roche Percee-Pinto section of the Souris River valley.

The rare plant species recorded for the Roche Percee-Pinto region of the Souris River valley are listed (in alphabetical order by latin name) and their known local occurrences, based on verified herbarium collections, are shown on the map (fig. 1).

The most significant 1986 discovery in the area was Indian Grass (*Sorghastrum nutans*), new to the known native flora of Saskatchewan. The collection was made about 1 mi. n., 0.3 mi. e. of Pinto (wc 36-01-06-W2), below prairie bluff rising above the gallery woods and bordering shrub zone north of the Souris River (28 August 1986, 36953). A single localized colony of about a dozen, rather small-sized plants was found. Indian Grass is one of the characteristic grasses of the Tall Grass Prairie Association found to the east and southeast. It is an additional species for the provincial list of rare plants.

Three other provincially rare grasses, also characteristic of the Tall Grass Prairie Association, were found and collected in the Roche Percee-Pinto region, as follows: Big Bluestem (*Andropogon gerardii*, at 6 sites), Side-oats Grama (*Bouteloua curtipendula*, at 4 sites), and Switch Grass (*Panicum virgatum*, at 3 sites). The characteristic habitat of all three grasses was similar to that described above for Indian Grass, - i.e. relatively mesic (seepage-watered), south-facing, lower to middle slopes of prairie bluffs rising above the gallery woods north of the Souris River, associated with or just below sandstone outcrops. East of Pinto, where such sandstone outcrops on south-facing bluffs north of the Souris River were especially frequent, plants of Big Bluestem, and Side-oats Grama were numerous. The latter seemed more frequent and better established here than elsewhere in the province, although limited to the described habitat. In contrast, Big Bluestem sometimes also occurred in prairie mesic depressions and on other slope aspects,

a *Andropogon gerardii* Big Bluestem
b *Antennaria neodioica* Tomentose Pussytoes
c *Asclepias syriaca* Common Milkweed
d *Bouteloua curtipendula* Side-oats Grama
e *Celastrus scandens* Climbing Bittersweet
f *Eleocharis compressa* Flat-stemmed Spike-rush
g *Helianthus tuberosus* var. *subcanescens* Jeruselem Artichoke
h *Laportea canadensis* Wood Nettle
i *Lomatium orientale* White-flowered Parsley
j *Onosmodium molle* var. *occidentalis* Western False Gromwell
k *Oxytropis lambertii* Lambert's Locoweed
l *Panicum virgatum* Switch Grass
m *Pellaea glabella* var. *occidentalis* Smooth Cliffbrake
n *Polygala alba* White Milkwort
o *Polygonatum biflorum* Great Solomon's Seal
p *Prunus americana* American Plum
q *Scutellaria lateriflora* Blue Skullcap
r *Sorghastrum nutans* Indian Grass
s *Verbena hastata* Blue Vervain
t *Viburnum lentago* Nanny-berry
u *Viola pedatifida* Crowfoot Violet

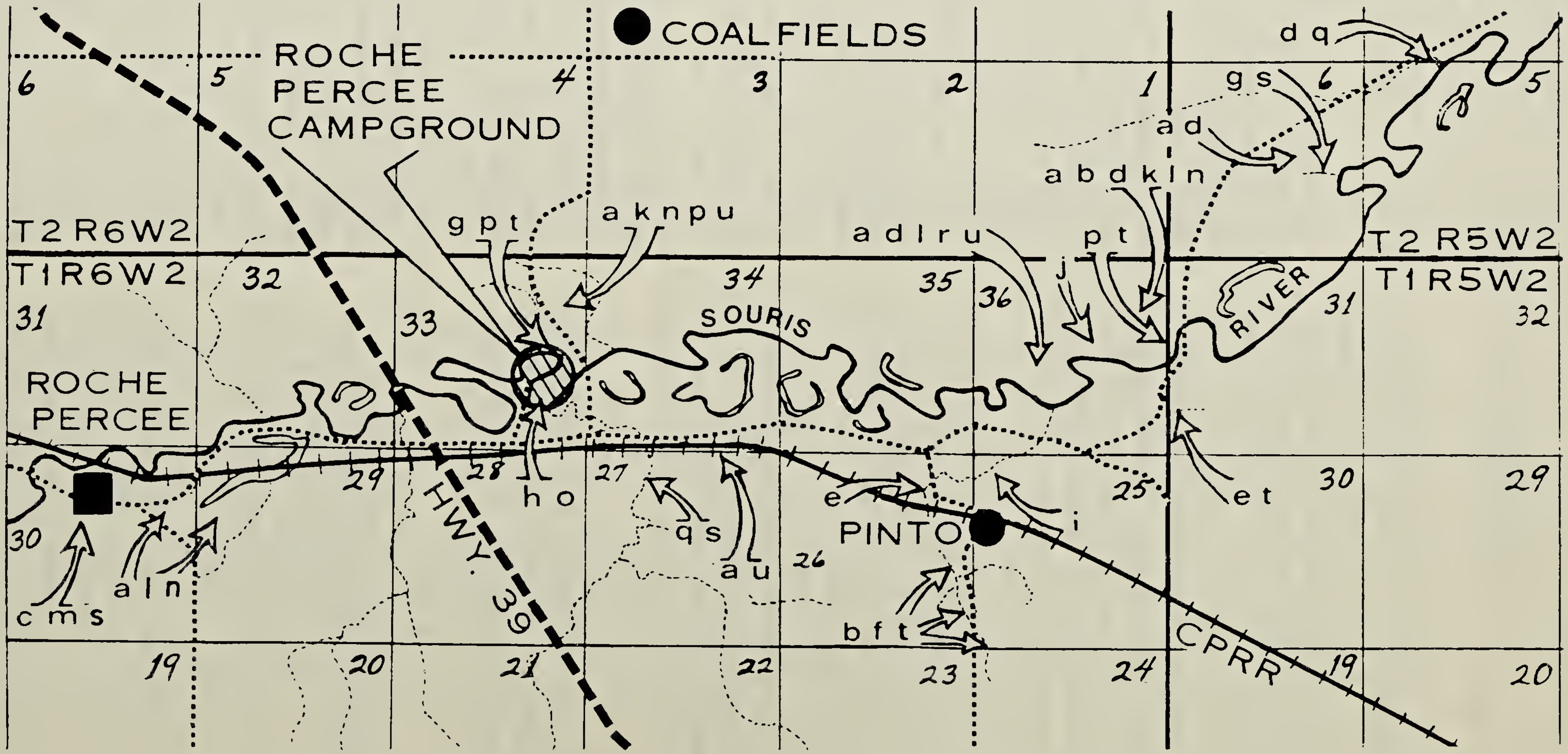


Figure 1. *The Roche Percee - Pinto area of the Souris River Valley, showing verified locality sites of provincially rare plants. The letters at each locality on the map are those preceding the names of the species present (as given above).*

shrubland margins,and even roadside ditches. Switch Grass was locally scarce wherever found. Abouguendia et al., during an ecological investigation of the Coalfields Community Pasture, (partly included in the area covered by this survey), also reported the latter three provincially rare grass species,[1] but the relevant collections were taken farther east than those of this survey, at about 5-8 mi. northeast and east of Pinto (Z. Abouguendia, pers. comm.).

Another interesting species found in 1986 was Climbing Bittersweet (*Celastrus scandens*) collected at two sites near Pinto as follows: about 0.3 mi. n.w. of Pinto (ne 26-01-06-W2), occasional plants climbing on Saskatoon-berry shrubs under dense Green Ash-American Elm-Manitoba Maple woods on n-facing ravine slopes above streamlet (27 August 1986, 36843); 1 mi. e., 0.3 mi. n. of Pinto, (sw 31-01-05-W2), very occasional plants climbing on Saskatoon-berry and Chokecherry shrubs under Green Ash-American Elm woods towards base of n-facing slope of wooded ravine between bluffs about 0.5 mi. s. of the Souris River (29 August 1986, 36995). These collections are the only Saskatchewan records for this woody climber, since the first provincial report from about 3 mi. southeast of Estevan (se 6-02-07-W2), where it was collected nearly 30 years ago on 3 August 1957 by John Hudson.[7] At that site the local population was still present in 1986 and well established. All plants seen at the 3 sites in 1986 were vegetative only, with no evidence of flowering or fruiting during that season. Blue Vervain (*Verbena hastata*) was found at Hudson's original

Climbing Bittersweet

G.J. Smith

site 3 mi. e. of Roche Percee, where, despite heavy cattle-trampling and grazing, an extensive local population was well established along a muddy streamlet channel. In addition, this species was collected from a site about 4.5 mi. n.e. of the original one, 2.5 mi. n.e. of Pinto (ec 6-02-05-W2), where a small colony occurred in a small ravine bottom along a marshy streamlet (29 August 1986, 37013).

Wood Nettle (*Laportea canadensis*) was found at the Roche Percee Provincial Campground, 2.5 mi. e. and about 0.5 mi. n. of Roche Percee (se 33-01-06-W2) where two sizeable local colonies occurred in moist depressions under dense Green Ash-American Elm-Manitoba Maple gallery woods along the Souris River (26 June 1986, 36002; 30 August 1986, 37055). This rare species for Saskatchewan was collected previously from near Glen Ewen (7 September 1960, B. Boivin, 14045, DAO & SASK), and from about 1 mi. s.-se. of Estevan by Hudson.[6] It seems to occur only in river gallery woods not subjected to much trampling and browsing by cattle. At the Roche Percee Campground, the human-disturbance appears to be more localized and less extensive than the cattle-disturbance elsewhere in the study region. (Unfortunately, the generalization does not seem to apply for human-disturbances at some other Souris River valley sites, such as the Woodlawn Regional Park south of Estevan and the Oxbow Regional Park.) Wood Nettle may be endangered by the excessive cattle and other disturbances of gallery and bluff woods so prevalent along the extent of the Souris River valley located in southeastern Saskatchewan.

Great Solomon's Seal (*Polygonatum biflorum*) was also found at the Roche Percee Provincial Campground, about 2.5 mi. e. and 0.5 mi. n. of Roche Percee (se 33-01-06-W2), where the plants were occasional and scattered in dense undergrowth beneath mesic American Elm-Green Ash-Manitoba Maple gallery woods along the Souris River (26 June 1986, 36014). This species had previously been collected from south of Estevan and near Oxbow (19 July 1951, B. Boivin & W.G. Dore, 8041, DAO & SASK).[8] In Saskatchewan it appears to be limited to the Souris River's gallery and bluff woods which lack obvious cattle-disturbance, is scarce wherever found, and perhaps, similarly to the Wood Nettle, could be endangered because of its intolerance to the extensive cattle-browsing and trampling that seems characteristic of most present Souris River gallery woods.

Blue Skullcap (*Scutellaria lateriflora*) was still present at the site 3 mi. east of Roche Percee where it was first collected 15 years ago by John Hudson. It was also found about 3.3 mi. ne. of Pinto (s. edge of sw 8-02-05-W2), where it appeared scarce (or at least difficult to detect) along a muddy streamlet channel at the shaded base of a n-facing, minor ravine slope (20 August 1986, 37029) wooded with Green Ash-Manitoba Maple.

Nanny-berry (*Viburnum lentago*) shrubs still grow at Hudson's earlier collection site south of Pinto, and also at several other nearby sites within se 21 and sw 15-01-06-W2. They were also present at three other localities as follows: (1) the Roche Percee Provincial Campground, 2.5 mi. e., 0.75 mi. n. of Roche Percee (ec 33-01-06-W2), where two local colonies of about 20 and 10 shrubs were found in upper gallery woods of Green Ash-Manitoba Maple-American Elm along the Souris River (27 June 1986, 36144-A; 26 August 1986, 36798); (2) 1 mi. e., 0.8 mi. n. of Pinto (ec 36-06-06-W2), about 15 tall shrubs in a similar habitat to the previous (26 June 1986, 36128-A; 28 August 1986, 36933); and (3) 1 mi. e., 0.3 mi. n. of Pinto (sw 31-01-05-W2); where a colony of 12 shrubs occurred under Green Ash-American Elm woods along an intermittent stream at the base of n-facing slope of a ravine between high prairie bluffs about 0.5 mi. s. of Souris River (29 August 1986, 37003). Hudson's collection

Nanny-berry in the Qu'Appelle Valley. *S.M. Lamont* from south of Pinto had been the only report of Nanny-berry from the Souris River valley previous to these records, which now show it to be well established within the limits of our study region.[9] Elsewhere in Saskatchewan, Nanny-berry is recorded from the lower Qu'Appelle River valley, Pipestone Creek and Thunderhill north of Duck Mountain.[11] [5] Breitung reported it also from Gainsborough on the basis of a cited Fraser Herbarium collection which we have been unable to locate.[3]

Tomentose Pussytoes (*Antennaria neodioica*) was collected 1 mi. n. and 0.8 mi. e. of Pinto (ec 36-01-06-W2), on s-facing prairie bluffs just n. of the Souris River (26 June 1976, 36109), a locality only about 1.5 mi. ne. of Hudson's 1978 site. The known Saskatchewan distribution of this species forms an unusual pattern that is difficult to interpret, consisting of the following three widely separated stations: Cypress Hills, Otter Rapids (on the Churchill River), and Pinto. It appears to represent a distinctive taxon rather than only an extreme form of another species, although some taxonomists have treated it as a variant of the more common and widespread *A. neglecta* Greene, - viz. as *A. neglecta* var. *attenuata* (Fern.) Cronq.

Lambert's Locoweed (*Oxytropis lambertii*), another species listed as rare in Saskatchewan, is apparently restricted in the province to the Souris and middle Qu'Appelle River valleys.[11] During 1986 it was collected from two sites as follows: (1) 0.25 mi. n of the Roche Percee Campground, 2.5 mi. e. and 1 mi n. of Roche Percee (ne 33-01-06-W2; 27 May 1986, 35322), and (2) about 1 mi. n., 0.8 mi e. of Pinto (ne 36-01-06-W2; 26 June 1986, 36045, 36115). Its habitat at both sites was the middle to lower slopes of open prairie bluffs just n. of the Souris River, where it was locally quite frequent and conspicuous.

Western False Gromwell (*Onosmodium molle* var. *occidentale*), another species accorded a rare status for Saskatchewan, was found at a site about 1 mi. n. and 0.5 mi. e of Pinto (c 36-01-06-W2), where it was scarce in the Western Snowberry short-shrub zone at the base of s-facing prairie bluffs bordering the gallery woods on the north side of the Souris River (28 August 1986, 36970). While this is the first collection from within our Roche Percee-Pinto study region (as delimited in fig. 1), it was recorded previously from the Souris River valley 2 miles southeast of Shand (18 July 1969, J.H. Hudson, 2625, SASK), a site only about 2 mi. west of Roche Percee and 7 mi. west of the station located within the study area.

The American Plum (*Prunus americana*) is known in Saskatchewan only from the Souris and Antler River valleys in the southeastern part of the province. The following collections are apparently the first for the Roche Percee-Pinto area: (1) Roche Percee Campground area, about 2.5 mi. e., 0.75 mi. n. of Roche Percee (ec 33-01-06-W2), forming dense thickets in gallery forest along Souris River (27 June 1986, 36144-B; 30 August 1986, 37053); (2) 0.25 mi. n. of Roche Percee Campground and Souris River, 2.5 mi. e., 1 mi. n. of Roche Percee (ne 33-01-06-W2), forming dense thickets in ravines between prairie bluffs (27 May 1986, 35320); initially noted by Donald F. Hooper; 25 June 1986, 35998); 1 mi. e., 0.8 mi. n. of Pinto (ec 36-01-06-W2), forming dense thickets in Green Ash-Manitoba Maple-American Elm gallery woods on north side of Souris River (26 June 1986, 36128-B; 28 August 1986, 36992). American Plum shrubs seem relatively tolerant of cattle-disturbance, perhaps because of the self-protection provided by their more or less thorny stems and the formation of dense thickets. While listed as rare for Saskatchewan because of a regional restriction to the Souris and Antler River valleys, American Plum shrubs appear relatively frequent there and often form sizeable local thickets.

Jeruselem Artichoke (*Helianthus tuberosus* var. *subcanescens*) was found at two sites in the Roche Percee-Pinto region, as follows: (1) about 2.5 mi. ne. of Pinto (ec 6-02-05-W2), a small colony at semi-open base of wooded ravine along streamlet n. of Souris River (29 Aug. 1986, 37016); and (2) in the Roche Percee Provincial Campground, about 2.5 mi. e., 0.75 mi. n. of Roche Percee (ec 33-01-06-W2), where a large colony of over 30 plants occurred at the open edge of an American Plum thicket bordering the American Elm-Green Ash-Manitoba Maple gallery woods along the Souris River (30 August 1986, 37054). This stately, showy sunflower species is thus far known in the province only from the Souris and Antler River valleys of southeastern Saskatchewan.[7] [11]

White Milkwort (*Polygala alba*) was collected at three sites within the Roche Percee-Pinto study region, where it was locally numerous and usually associated with sandstone outcrops on s-facing middle or lower slopes of prairie bluffs above the Souris River (see Fig. 1).

Crowfoot Violet (*Viola pedatifida*) was collected in 1986 from three local sites within the Roche Percee-Pinto study area (see Fig. 1). Although relatively widespread in the southern one-third of Saskatchewan, this species was accorded a borderline rarity status for the province in part because of its presumed scarcity at all known localities.[11] Its local abundance at various sites along the Souris River valley makes the rare status of this species more questionable.

In addition to the 21 rare plants already listed, it might be noted that two provincially rare sedges, *Carex assiniboinensis* W. Boott. and *Carex gravida* Bailey, would have been included if the arbitrary boundaries of our Roche Percee-Pinto study area (as mapped in fig. 1) had been extended three miles westward to include the Souris River valley south of Shand, where they were originally collected under open ash-elm woods, 18 July 1969 by John Hudson.[11]

A northeastern portion of our Roche Percee-Pinto study region was included within the proposed "Pinto/Souris River Valley" Natural Area, by the International Biological Program (as I.B.P. Area 71-22).[10] The I.B.P. field reconaissance team limited their botanical survey to a listing of dominant plants of the various vegetational communities and did not note or report any rare plants for the proposed natural area, although 15 provincially rare species were recorded during 1986 from within the boundaries. In a more recent report reviewing the proposed IBP Natural Areas in Saskatchewan, Chris Adam did list a provincially rare plant, the Blue Phlox (*Phlox alyssifolia* Greene), within his reduced boundaries of the proposed "Pinto-Souris Natural Area."[2] Blue Phlox, which is otherwise unrecorded in the province east of the Big Muddy area, is an additional plant rarity for the Roche Percee-Pinto study region, but until the record is substantiated and known to be documented by a voucher herbarium specimen, it can only be accepted as an unverified report.

The collection numbers cited in this paper are those of the author, with those of late May 1986 (numbers less than 35478) made with co-collectors' Donald F. Hooper and Les Baker, and those of late June when accompanied by Ramona Harms (numbers 35855-36205). All voucher specimens have been deposited in the W.P. Fraser Herbarium (SASK), University of Saskatchewan, Saskatoon, Saskatchewan.

Acknowledgements

The partial support of this project by the August and Mathilde Breitung Saskatchewan Vascular Flora Research Assistance Fund and by the World Wildlife Fund, Canada, is gratefully acknowledged.

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[2] ADAM, C.I.G. 1985. Natural Areas in Saskatchewan: A Review of the IBP System. Prepared for the Saskatchewan Natural History Society. 264 pp., map.

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[10] INTERNATIONAL BIOLOGICAL PROGRAM. 1972. IBP-CT Check Sheet for the Pinto Natural Area - Souris River Valley, IBP no. 71-22 (Surveyors: H. Morrison and M. Cranna). 21 pp., maps.

[11] MAHER, R.V., G.W. ARGUS, V.L. HARMS, and J.H. HUDSON. 1979. The Rare Vascular Plants of Saskatchewan. Syllogeus No. 20, National Museums of Canada. 55 pp., 25 pp. of maps.

Ground Plum

Bernard de Vries

PRAIRIE SPECIES OF PLANTS FOUND ON THE AMAZING HILL AT STURGIS

DONALD F. HOOPER, Box 40, Somme, Saskatchewan. S0E 1N0

As you travel along Highway # 9 at the north edge of Sturgis you can see a hill to the east which overlooks the town and the Assiniboine River valley. A person can't help noticing the hill because high on its open south facing slope are large letters made of cement spelling out the name "STURGIS." A flagpole stands beside the name. The sport's ground is right at the bottom of the hill. The whole setting attracts one's interest to this lovely Saskatchewan town.

Sturgis is on the fringe of the parkland and mixed forest zones. The hill top is covered with the ordinary short Aspen woods of the parklands. The Aspen understory shrubs are mostly Saskatoon, Chokecherry, and Beaked Hazelnut. The dry south facing slope is mostly grassland, with very little shrubbery.

Les Baker of Carragana and I visited the hill on 6 June, and 23 July 1986. We were very surprised at the many species of prairie plants that we found on the hillside. Some of these are rare in eastern Saskatchewan north of the Qu'Appelle Valley.

The following is a list of species that we collected. (Also included are a few sight records). Duplicates of these herbarium specimens will be sent to the W.P. Fraser Herbarium, University of Saskatchewan, Saskatoon, Saskatchewan. This is by no means a complete inventory of all the species that occur on this hill.

GRAMINEAE - grass family.

Little Bluestem - *Andropogon scoparius* Michx.
Blue Grama - *Bouteloua gracilis* (HBK.) Lag.
Nodding Brome - *Bromus porteri* (Coult.) Nash
Sand Grass - *Calamovilfa longifolia* (Hook.) Scribn.
Timber Oat Grass - *Danthonia intermedia* Vasey
June Grass - *Koeleria gracilis* Pers.
Prairie Muhly - *Muhlenbergia cuspidata* (Torr.) Rydb.
Spear Grass - *Stipa comata* Trin. & Rupr.
Richardson's Needle Grass - *Stipa richardsonii* Link
Western Porcupine Grass - *Stipa spartea* Trin. var. *curtiseta*
Green Needle Grass - *Stipa viridula* Trin.

LILIACEAE - lily family

Pink-flowered Onion - *Allium stellatum* Fraser
Prairie Onion - *Allium textile* Nels. & Macbr.

RANUNCULACEAE - crowfoot family

Long-fruited Anemone - *Anemone cylindrica* A. Gray

CRUCIFERAE - mustard family

Small Flowered Prairie Rocket - *Erysimum inconspicuum* (S. Wats.) Macm.

ROSACEAE - rose family

Prairie Cinquefoil-*Potentilla pensylvanica* L.
Low Prairie Rose - *Rosa arkansana* Porter

LEGUMINOSAE - pea family

Ground-plum - *Astragalus crassicarpus* Nutt.
Slender Milk-vetch - *Astragalus flexuosus* Dougl.
Purple Prairie Clover - *Petalostemon purpureum* (Vent.) Rydb.
Silverleaf Psoralea - *Psoralea argophylla* Pursh
Indian Breadroot - *Psoralea esculenta* Pursh

EUPHORBIACEAE - spurge family

Thyme-leaved Spurge - *Euphorbia serpyllifolia* Pers.

COMPOSITAE - composite family

Linear-leaved Wormwood - *Artemisia dracunculus* L.
Many-flowered Aster - *Aster ericoides* L.
Upland White Aster - *Aster ptarmicoides* (Nees.)T & G.
Hairy Golden Aster - *Chrysopsis villosa* (Pursh) Nutt.
Rough Fleabane - *Erigeron asper* Nutt.
Beautiful Sunflower - *Helianthus laetiflorus* Pers. var. *subrhomboideus* Rydb.
Meadow Blazingstar - *Liatris ligulistylis* (A.Nels.) K.Schum.
Dotted Blazingstar - *Liatris punctata* Hook.
Low Goldenrod - *Solidago missouriensis* Nutt.
Showy Goldenrod - *Solidago nemoralis* Ait.
Mountain Goldenrod - *Solidago spathulata* DC.

Since the hill at Sturgis is on the edge of the parklands, I would not expect that any of the prairie species found here are introductions.

The hill at Sturgis is a special one. I hope that the town and area will realize this and protect the natural plant growth found on the south facing slope of this amazing hill. We sparingly collected a few herbarium specimens so that it could be officially recorded that this area is of great importance botanically, and should be protected.

A trail along the top edge of the prairie and aspen makes the flagpole, and the word "STURGIS" easily accessible. All travel on the hill should be limited to this trail. The all-terrain vehicles should not be allowed on the open slope, as many of these plant species could disappear.

Sturgis — you have a great hill there. I hope that it remains that way.

CHECKLIST OF CANADIAN BIRDS

The Canadian Society of Ornithologists has arranged for the publication of a Checklist of Canadian Birds/Liste de reference des oiseaux du Canada. This list, prepared by Dr. R.D. James of the Royal Ontario Museum gives the scientific, French and English common names and breeding status of all 579 species of bird recorded in Canada up to the end of 1984. It corresponds to the birds described by Earl Godfrey in his second edition of *The Birds of Canada*,

The list is bound in pocket-size form and would be a useful addition to any naturalists field gear.

Copies of the checklist can be obtained by sending two ($2.00) dollars to:

Ornithology Checklist
c/o Dr. W. Bruce McGillivray
Provincial Museum of Alberta
12845 - 102 Avenue
Edmonton, Alberta T5N 0M6

CHRISTMAS BIRD COUNT CORRECTION

Due to an error in the alignment of numbers of the Christmas Bird Count tables (Blue Jay 45(1): 11-17; March 1987) the numbers for Mallard fall under the wrong count names. The counts for Mallard should be as follows:

Abernethy-Katepwa Lake	13
Crooked Lake	104
Fort Qu'Appelle	63
Gardiner Dam	1098
Qu'Appelle Dam	3
Regina	19
Saskatoon	4
Squaw Rapids	6

EARLY MANITOBA OOLOGISTS*

C.STUART HOUSTON, 863 University Drive, Saskatoon, Saskatchewan, S7N 0J8 and MARC J.BECHARD, Department of Biology, Boise State University, Boise, Idaho, U.S.A. 83725

The first collector of natural history specimens in what is now southern Manitoba was Donald Gunn, Senior. Born at Halkirk, Caithness, Scotland, in September 1797, Gunn entered the service of the Hudson's Bay Company (HBC) in 1813 and was stationed successively at York Factory, Severn and Oxford House. In 1819 Gunn married Margaret, daughter of James Swain and his native wife of York Factory. He left the company service in 1823 and settled at St.Andrew's, just north of present Winnipeg. Here he was the first teacher and first librarian, and for about 20 years Judge of the Court of Petty Sessions. He was a member of the Legislative Council of Manitoba, equivalent to a senate, from 1871 until its abolition in 1876.[11] In 1880, Gunn (posthumously; he died in 1878) and C.R. Tuttle published *A History of Manitoba From the Earliest Times.*[10]

In 1857 Gunn submitted specimens of at least 40 bird species to the Smithsonian Institution. A few of these were collected for him by John Isbister. They arrived in three boxes at St. Paul, Minnesota on 31 July, carried in Red River carts by freighter Charles Cavalier of Pembina — who also collected specimens for the Smithsonian (D. Zochert, pers. comm.). In addition to the bird specimens were a shrew, *Sorex palustris*, and a vole, *Arvicola xanthognathus*, both the first of either species that Baird had seen. The birds arrived in time for publication in Baird's 1005-page *Birds.*[2] Gunn was thus the first of a long series of fur-traders who responded to the enthusiastic requests of Baird, one of the most prolific letter writers of all time. Gunn, often accompanied by his son, Donald Gunn, Jr., continued collecting for the Smithsonian. In 1862 he took a set of Piping Plover eggs on Lake Winnipeg, where he also observed Common Terns nesting on gravelly islands.[5] This trip was helped by a $50 expense account from Baird.[7] In 1865 and again in 1867, when he left Fort Garry on 10 June, Gunn made egging expeditions to Shoal Lake, northwest of Winnipeg.[9] Here he found hundreds of Western Grebe nests holding 2,3, or 4 eggs each, and collected 63 sets. He found males incubating the eggs and described their courtship behaviour "raising themselves out of the water, and flapping their wings, their white breasts glistening in the sun like silver." Black-crowned Night-Herons were nesting among the reeds in great numbers and one set of eggs was taken. He also collected 1 set each of Double-crested Cormorant and Forster's Tern, 12 sets of Eared Grebe and 8 sets of Franklin's Gull. Later three sets of Ring-billed Gull and one of Herring Gull were taken at Lake Winnipeg. Duck sets, collected chiefly in 1865 and 1867, some at Lake Winnipeg, included Blue-winged Teal (2), Northern Shoveler, Gadwall, American Wigeon (2), Redhead (4) and Ruddy Duck (2). A Spotted Sandpiper set was taken at the Red River settlement and a Sharp-tailed Grouse set near Lake Winnipeg. Land birds were less of an attraction, in part because they were so difficult to identify, but the Smithsonian collection still contains undated Gunn sets of the American Crow, Sedge Wren, Veery, Brown Thrasher, Red-eyed Vireo, Common Grackle, Northern Oriole and six eggs of the Brown-headed Cowbird.

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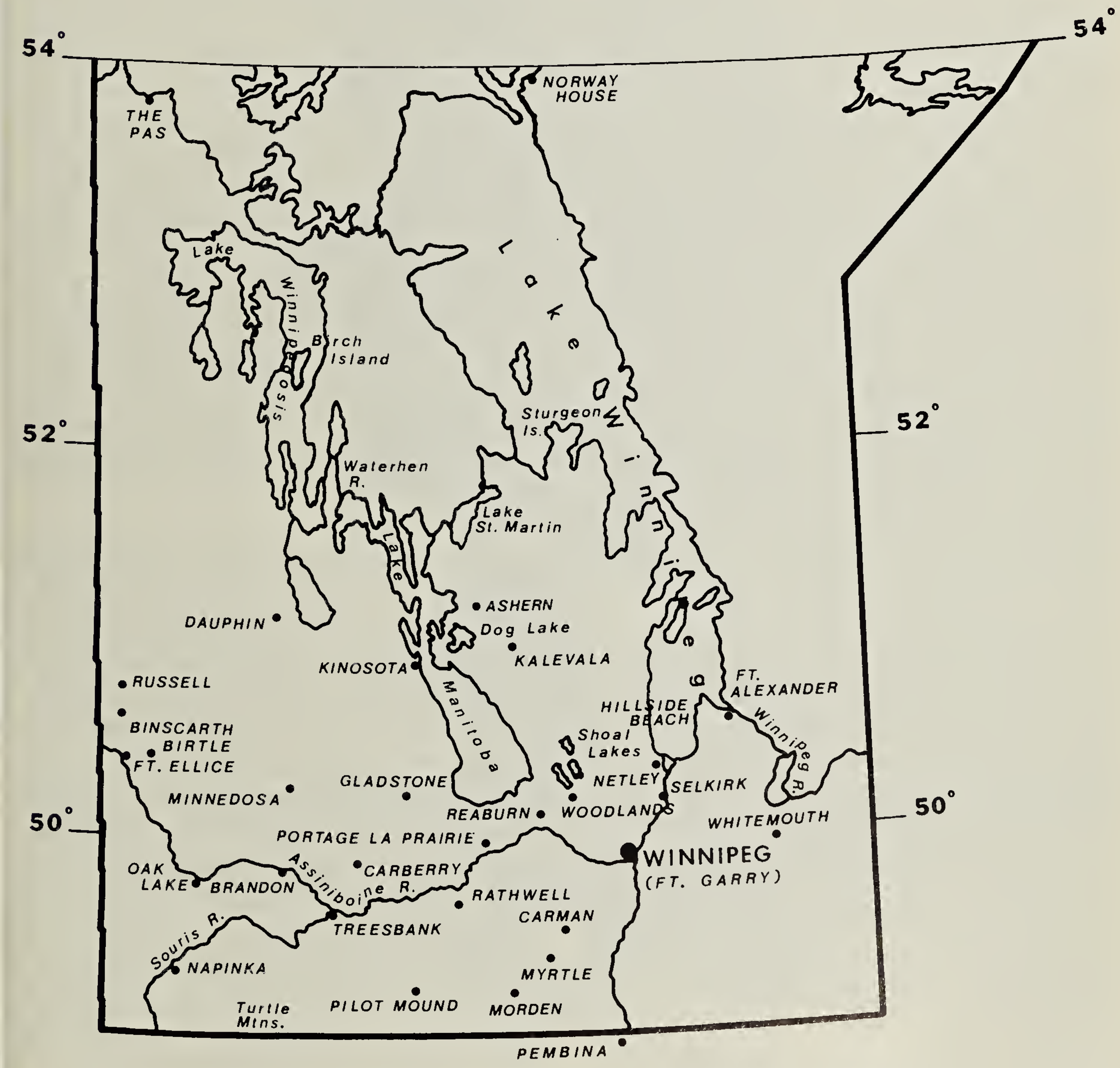
*sixth in a series on oologists of the Northern Great Plains

Donald Gunn (frontispiece to his posthumous book, with C.R. Tuttle, History of Manitoba.)

Sometimes, as with the oriole, the nest was submitted as well. Finally there were dated sets of Clay-colored Sparrow eggs taken in 1860, Cedar Waxwing in 1864, and Black-billed Cuckoo, Gray Jay, Blue Jay and Rose-breasted Grosbeak in 1868. All of the above eggs (108 sets of 30 species), including those of the Piping Plover, are listed in the computerized catalogue of National Museum of Natural History (NMNH) holdings at the Smithsonian Institution. There is also a set of five Western Grebe eggs in the American Museum of Natural History (AMNH).

[Later generations of the Gunn family continued an interest in natural history. Donald Gunn, Jr., had a timber lease and sawmill 30 miles northeast of Birtle, Manitoba, then married a granddaughter of Peter Fidler, "Canada's Forgotten Surveyor" and moved to Fort Qu'Appelle where his son John was born in 1883. Beginning in 1887, the Gunns ranched on the south shore of Good Spirit Lake, northwest of Yorkton in present Saskatchewan. John Gunn told the late Mrs.Isabel Priestly of the changes he had observed in his 46 years' residence there. Four years after



Map of southern Manitoba.

Donald Jr.'s death in 1927, Good Spirit Provincial Park became one of the six original Saskatchewan parks. John's daughter Joyce and her husband Bill Anaka, for some years editors of the SNHS Newsletter, continue bird observations at Good Spirit Lake.]

Three contemporary fur traders each contributed one set of eggs to the NMNH collection: Yellow Warbler from W.S.Morgan, Song Sparrow from W.M.McIntosh, and Rose-breasted Grosbeak from William McMurray, while he was stationed at Fort Alexander at the mouth of the Winnipeg River.

Coincidentally, 1857 was also the year for southern Manitoba's first visit by a professional naturalist in the person of a 21-year-old American, Robert Kennicott. Born in New Orleans on 13 October 1835, the son of a physician, Kennicott grew up at The Grove, near present Glenview, 20 miles northwest of Chicago.[32] He received little formal schooling, but studied natural history under two well-known physician-ornithologists, Dr.J.E. Kirtland of Cleveland and Dr.P.R. Hoy of Racine, Wisconsin. This training was sufficient to gain him the leadership of a natural history survey of Illinois in 1855 and appointment as the first curator of natural history at Northwestern University, Chicago, in 1857.[26]

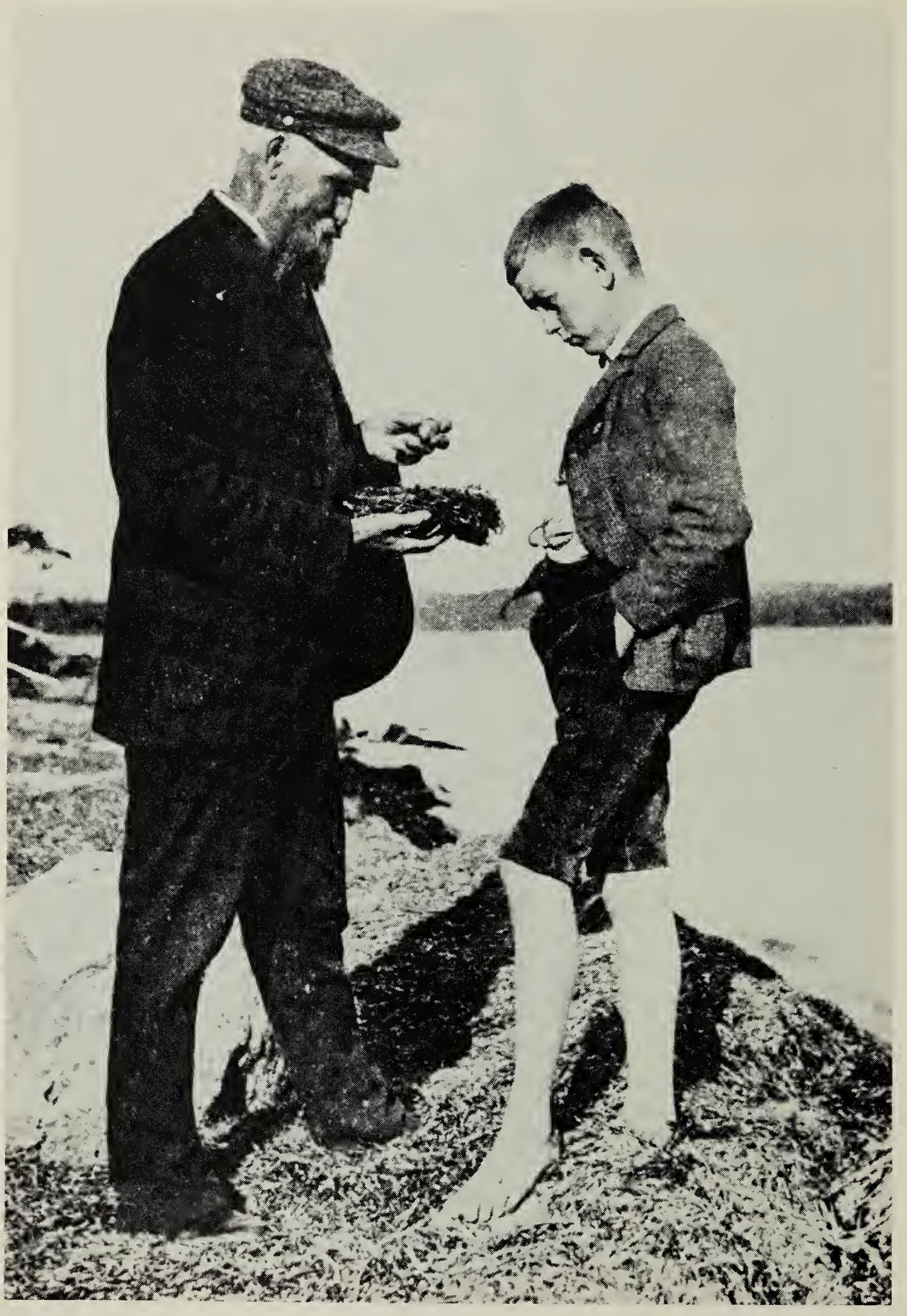
Kennicott's first collecting trip outside of Illinois, at an inappropriate time of year for this purpose, took him up the Mississippi to St.Paul. On 31 July 1857 he joined Charles Cavalier's cart train to Fort Garry, the same conveyance that had just brought Gunn's specimens south. They did not reach Pembina until 5 September. Kennicott spent only about one week (at least from 5 through 10 September), at the Red River or Selkirk settlement (D. Zochert, pers. comm.) Chief Factor William MacTavish, headquartered at what is now Winnipeg, befriended the young man as he collected ethnological artifacts, and bird and mammal specimens which had been preserved in alcohol. Kennicott met Donald Gunn, leaving him alcohol for specimen preservation and tools for his wife to skin specimens. Later, Kennicott described Gunn to Baird as "a fine old Scotsman who likes distinction and likes to be praised" (D. Zochert, pers. comm.)

After returning through St.Paul on 14 October and making a brief stop in Chicago, Kennicott spent the winter at the Smithsonian Institution in Washington under the tutelage of Spencer Fullerton Baird. When he left at the end of April 1858, Kennicott had fashioned a grand design for a personal collecting trip to northwest Canada, to be augmented by collections from interested fur traders throughout the vast territory under the control of the Hudson's Bay Company. This double-pronged effort was "destined to add, by his travels and collections, directly and indirectly perhaps more than any other collaborator, to the riches of the Smithsonian Collection."[7] Letters from the Smithsonian gained the strong support of HBC Governor Sir George Simpson, who offered "full co-operation and free transportation for any collections," a most unusual concession to anyone, least of all a young American.[26]

After a year of preparation, Kennicott left Chicago in April 1859, travelling by steamship via Collingwood to Fort William and thence by canoe through Fort Frances (where he met William McMurray) and Lake of the Woods to the Winnipeg River, where he collected a Merlin nest with two eggs on 2 June.[15] From Fort Alexander at the mouth of the Winnipeg River, he travelled north along Lake Winnipeg where he collected three sets of American Crow eggs, two of them on 6 and 9 June, and two sets of Song Sparrow, on 8 and 17 June, plus sets of Brown Thrasher and Herring Gull (NMNH). He was at Norway House 11-15 June.[15]

Charles A. Hubbard of Milwaukee, a relative (probably nephew) of Dr. Hoy's,

Robert Kennicott.



John Macoun about 1895 (Courtesy Macoun Field Club, Ottawa; donated by Mary Macoun Kennedy, granddaughter of John Macoun).

had accompanied Kennicott as far as Fort Alexander, but Hubbard then turned south to Fort Garry, where he collected sets of Veery, Gray Catbird, Yellow Warbler, Clay-colored Sparrow and Brown-headed Cowbird for the NMNH.[8] Kennicott continued on to Great Slave Lake and the Mackenzie River. Though Baird wrote that "the egging . . . is the main point," Kennicott collected many skins of birds and mammals as well.[7]

Richard H.Hunter, the second resident Red River valley oologist (after Donald Gunn), made a visit to West Shoal Lake, north of Woodlands, on 1 June 1878 and counted 600 White Pelican eggs and 700 eggs of the Double-crested Cormorant on a small half-acre island. He took only a small sample of these.[29]

John Macoun deserves mention, though his first two western trips were as a botanist without expertise in ornithology — first with Sandford Fleming and Rev. George M.Grant, seeking a route for the Canadian Pacific Railway in 1872, and then exploring northern British Columbia and northern Alberta in 1875. In 1879 and 1880, Macoun first collected a few birds and mammals as well as plants, when he ascended the Assiniboine on a steamboat, before continuing west.[17]

On 23 June 1881, Macoun made his most important oological find — about a dozen nests of the Passenger Pigeon along the Waterhen River. The nests were "such flimsy structures that the eggs were clearly seen through the interstices from below, and one old bird was shot as she sat. Only two eggs were taken."[18] [Surprisingly, these Passenger Pigeon eggs are not now in the National Museum of Canada (NMC) collection]. Macoun's added another important nest record for Manitoba on 12 June 1896, when when he found North America's second Connecticut Warbler nest in a tamarack swamp at Sewall, south of Carberry.[18]

Ernest Evan Thompson, who later took the name of Ernest Thompson Seton, first arrived in Manitoba in the spring of 1882. Living with his brothers Arthur and Charlie near Carberry, he made trips south to Turtle Mountain and northwest to Fort Ellice, Binscarth and Russell. In June 1883, he sent egg sets of Upland Sandpiper (3), Swainson's Hawk (2), Mallard, Sharp-tailed Grouse, Common Nighthawk, House Wren, Gray Catbird, Clay-colored Sparrow, Red-winged Blackbird, Brewer's Blackbird and Baltimore Oriole to the NMNH. Most noteworthy in this collection was North America's first nest of the Connecticut Warbler, found near Carberry on 21 June.[22] [27] In August, Seton and his friend, R. Miller Christy from England, visited the Criddle family near Treesbank, and showed sons Norman and Stuart, only 8 and 5 years of age, how to prepare bird skins. Seton's October 1883 trip to locate a homestead near present Runnymede, Saskatchewan, and his return visit in June 1884 have been described in detail.[13] During the latter trip Seton found North America's first nest of the Philadelphia Vireo on 8 June, in a willow 10 feet from the ground, the only nest recorded for another 19 years.[28] He found both species of Wood Pewee, Eastern and Western, on the slopes of Duck Mountain and also found Connecticut Warblers resident in a tamarack swamp there.[29]

Seton's autobiography states that he worked in New York from September 1885 until October 1886, yet in the NMNH are 1886 Carberry egg sets of the Horned Grebe (31 May), Ruffed Grouse (18 May) and Sharp-tailed Grouse (no date), perhaps collected for him by his brother.[22] Seton did return to the Carberry area in 1892, noting how the Upland Sandpiper, Chestnut-collared Longspur and Sprague's Pipit had virtually disappeared and the Swainson's Hawk had become greatly reduced in numbers as the prairie succumbed to the plow. In contrast, the Eastern Bluebird had become quite common, the Mourning Dove had increased phenomenally, and the new immigrant from Minnesota, the Greater Prairie Chicken, was now everywhere.[13] [30]

Ernest Thompson Seton, a self-portrait in 1879.

We know almost nothing about four men who collected eggs in the 1880s. L.D. Schultz collected at Lake Winnipeg from 1877 through 1886. On 9 May 1877 he took a set of two Whooping Crane eggs, now in the Western Foundation of Vertebrate Zoology (WFVZ). He took two sets of Horned Grebe eggs — on 2 July 1882 (AMNH) and on 7 July 1885 (NMNH). Raptors are represented in the WFVZ by a set each of Sharp-shinned Hawk on 24 May 1883, three fresh Merlin eggs from "a natural cavity 50 feet above the ground" on 28 May 1884 and a misidentified "Rough-legged Hawk" set on 22 May 1886 (WFVZ).[4] W.W. Worthington took another set of similarly misidentified hawk eggs at Fort Alexander on the eastern shore of the same lake on 1 June 1885.[4] O.G. Turner,Jr.collected the following sets: Golden-crowned Kinglet at Minnedosa on 28 May 1886, Goshawk from near Gladstone on 20 May 1887, and Peregrine Falcon on 20 May 1887.[3] Review of the latter eggs with Lloyd Kiff suggests correct identification, but no one can conceive where a 13 m clay cliff could be found near Gladstone. In 1889, D.B. Bowles collected American Crow eggs from Sturgeon Island, Lake Winnipeg (NMC).

During geological explorations around Lake Winnipegosis, Lake St. Martin and Lake Manitoba in 1887 and 1889, Joseph Burr Tyrrell collected a few sets including those of White Pelican, Double-crested Cormorant, Spotted Sandpiper, Herring Gull, Common Tern, Common Grackle and Red-winged Blackbird, the last nest including a Brown-headed Cowbird egg (NMC).[16] Not all of the early collectors fared so well. In fact two lost their lives in the 1880s. The first was Willie Brodie, Jr., the son of Toronto dentist and naturalist Dr. William Brodie, Sr., for whom Toronto's Brodie Club was named. Willie Brodie, a close friend of Thompson Seton's, returned once to Toronto and presented "Notes of the Natural History of Manitoba" to the Natural History Society of Toronto. These notes were published in the Canadian Sportsman and Naturalist.[6] Willie drowned in 1884 when his canoe overturned in the upper Assiniboine River just south of the present site of Kamsack.

T.B. Wood from Middleton, near Manchester, England, settled at Brandon, then terminus of the CPR, at the end of May, 1882. For 18 months he kept careful records of his bird observations and specimens collected. These were published in *The Zoologist.*[31] In addition to the birds collected as specimens, he took 129 ducks, 119 Sharp-tailed Grouse and 14 Ruffed Grouse for his fall and winter food in 1882. Wood, as far as we know, collected egg sets only of the Blue-winged Teal and Killdeer. In late October 1883, aged 26 years, he shot a Bufflehead on a slough. "He incautiously waded into the water up to his waist to retrieve the bird, thereby contracting a severe cold and inflammation, which resulted in his death in a very short time."[31]

Oology became the main, rather than merely a secondary motivation, for collectors who came to Manitoba during the 1890s. Edward Arnold made egg-collecting trips to the prairies almost yearly from Battle Creek, Michigan, beginning in 1894.[14] Manitoba sets of Red-necked Grebe (2 sets from West Shoal Lake), Sharp-tailed Grouse, Le Conte's Sparrow (a single egg from Reaburn, 6 June 1894) Sharp-tailed Sparrow (4 eggs from near Rathwell, 15 June 1904), and a Savannah Sparrow set from Reaburn are in NMNH. Sets of American Bittern, Blue-winged Teal, Sharp-shinned Hawk (2), Black Tern and Forster's Tern are in WFVZ. Sets of Broad-winged Hawk (Woodlands, 2 eggs, 11 June 1894) and Yellow-headed Blackbird are in NMC.

G.F.Dippie and Walter Raine were both dealers in bird eggs in Toronto. Dippie took a set of five Le Conte's Sparrow eggs (WFVZ),as well as Horned Grebe (WFVZ) and Killdeer sets (NMC) at Reaburn in early June 1893, and Ring-billed Gull and

Forster's Tern sets at Lake Manitoba two weeks later. It is probable that sets of two Whooping Crane eggs, collected at Oak Lake on 16 and 18 May 1900 by T.W. Richards and an unknown collector, passed through the hands of either Dippie or Raine.[1]

Raine came almost yearly to the Prairie Provinces; his Saskatchewan records have been thoroughly assessed.[12] His Manitoba collections include sets of Whooping Crane eggs collected at Oak Lake in 1891, 1893(NMC) and 1894(AMNH), and another from the Netley-Libau marsh in 1891. Other Raine sets from southern Manitoba still extant in the NMC, NMNH, AMNH and WFVZ include those of the Red-necked Grebe, Double-crested Cormorant, Black-crowned Night Heron (Lake Manitoba, 6 June 1893), Canada Goose, Ring-necked Duck, Lesser Scaup, White-winged Scoter, Bufflehead, Common Merganser, Red-breasted Merganser (8 sets from Lake Winnipegosis in 1902, 1903 and 1906), Common Merganser, Sharp-shinned Hawk, Merlin (from Oak Lake and Napinka), Greater Prairie Chicken (Reaburn, 9 June 1894), Sandhill Crane (2 eggs from Long Lake near Reaburn on 18 June 1891), Ring-billed Gull, Franklin's Gull (3 nests from Lake Winnipegosis in 1903, and others from a swamp near the south end of Lake Manitoba in 1894, 1896 and 1899), Forster's Tern (identified correctly only in 1912, when three eggs were taken from a platform of dead rushes at Lake Manitoba on 20 June), Black Tern, Short-eared Owl, Boreal Chickadee (Lake Winnipegosis, 1903 and 1906), Brown Creeper (5 eggs from Lake Winnipegosis on 1 June 1903), Marsh Wren, Leconte's Sparrow (5 eggs at Reaburn 21 July 1893, 2 eggs at Shoal Lake 10 June 1894 and 2 eggs at St. Marks at the south end of Lake Manitoba 12 June 1894), Sharp-tailed Sparrow (2 eggs at Reaburn 15 June 1893), Song Sparrow, Vesper Sparrow, and Brown-headed Cowbird. At Lake Winnipegosis in June 1903 he took Boreal Chickadee sets of 6, 7 and 8 eggs in decayed stumps and sets of Sedge Wren, Solitary Vireo and Northern Yellowthroat.

The Ornithologist, an interesting but short-lived English publication edited by Harry Kirke Swann, contains a previously overlooked six-page article by Walter Raine, who with Edward Arnold spent five days collecting at West Shoal Lake in the second week of June 1894. Sets from this trip, including those of Red-necked Grebe, are in NMNH, WFVZ, and NMC. The next week, on 18 June, Raine returned. The low island, which had been covered with Common Terns and Ring-Billed Gulls the previous week, was forsaken due to waves having washed over it during a storm. Raine had a folding canvas boat with which he was able to reach two other islands, the first of which contained White Pelican and Double-crested Cormorant nests. They left the second island at 10 p.m.as it became dark, the front of their boat heavily laden with eggs. They reached Pelican Island, in high waves, their boat full of water; after redistributing the eggs and gear into the rear of the boat they were able to reach the mainland safely. Next morning Raine spent three hours blowing the eggs. Raine reported that this was "one of the roughest times I ever experienced in North West Canada."[19]

Raine's article may have prompted the visit of Charles Doncaster Swann, who perhaps met his death in the manner that Raine narrowly escaped, although Swann's nephew does not know the details, apart from a brief obituary in *The Ornithologist.* "The death at Shoal Lake, Manitoba, on July 27 (as the result of the most lamentable accident) of Charles Doncaster Swann removes a most promising and enthusiastic field-naturalist and collector. He was the younger brother of the editor of this magazine, and was only in his 19th year; he left England four months ago."[25] [Harry Kirke Swann had visited Nova Scotia in 1891-92, published *Nature in Acadie*, and later became a natural history bookseller.[24] He had one of the world's largest birds-of-prey egg collections, which after his death went to Herbert Brant of Cincinnati and thence to the Museum of Comparative Zoology of Harvard University.]

Although the following records were overlooked by A.W. Schorger in his masterful monograph, *The Passenger Pigeon*, its Natural History and Evolution, it appears that Manitoba may claim some of the last known nests of the Passenger Pigeon, even after those found by John Macoun.[21] A single Passenger Pigeon egg from the A.C. Bent collection, taken by J.Bell at Oak Lake, Manitoba, on 2 June 1883 is now in the USNM. Reed's *North American Birds Eggs* illustrates an egg collected by Joe Flamay on the "southwest shore of Lake Manitoba, June 1, 1891. Nest of twigs in an aspen tree." This egg is much too large to risk being confused with that of a Mourning Dove.[20] (The only other Flamay egg set extent seems to be a Canvasback set of 9 eggs taken at Lake Manitoba on 2 June 1909; WFVZ). Finally, Messrs. Stevens in London, England, sold at auction on 13 March 1928 a set of two Passenger Pigeon eggs obtained on 3 June 1894 at Oak Lake, Manitoba, but the presence of two eggs instead of the usual one makes this set suspect.[23] Most likely Flamay and the unknown Oak Lake collector sent their eggs to Walter Raine or another Ontario egg dealer.

Acknowledgements

We wish to thank Lloyd Kiff of the Western Foundation of Vertebrate Zoology; Henri Ouellet of the National Museum of Canada; Alison Victor Andors of the American Museum of Natural History; Ross James of the Royal Ontario Museum of Zoology, and James Dean of the National Museum of Natural History, for assistance concerning their egg collections. Don Zochert shared unpublished material concerning Robert Kennicott, Joyce Anaka provided information about John Gunn and Donald Gunn, Jr. Mary Houston helped transcribe egg data at WFVZ and indexed the egg data by collector and by species. J.B. Gollop and Margaret Belcher provided constructive criticism.

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Greater Prairie Chicken on nest, May 1946 G.J. Smith

1986 - A BRILLIANT YEAR FOR THE GREAT WHITE BIRD

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The 1986 fall migration of Whooping Cranes was the slowest in 12 years. Over the past 26 years, an average of 82% of the crane population summering in the Wood Buffalo National Park (WBNP) area had reached the Aransas National Wildlife Refuge (ANWR) winter range by 10 November, but in 1986 only 25% had reached the refuge by that date, according to T.V. Stehn, United States Fish and Wildlife Service (USFWS). The reasons for the protracted fall migration are unclear but probably relate to a relative absence of severe fall weather along the flyway and excellent habitat conditions on the summer range. These factors may have kept the cranes in and near WBNP for longer than usual periods. B. Johns, Canadian Wildlife Service (CWS), advised that fall sightings of Whooping Cranes in Saskatchewan were few in 1986 and it appears that most of the cranes ignored the prairie stubble fields where in most years the birds will feed on waste barley and wheat for several weeks. Perhaps the cranes already were in excellent condition and did not require the lengthy staging period in Saskatchewan.

Information obtained from Aransas indicates that 111, Whooping Cranes including 21 juveniles were accounted for by 2 February 1987, easily surpassing the 1985 all-time record of 97 birds which included 16 young. The total of 111 contains three birds not on the Aransas refuge. One of these, a bird hatched in 1985, left the refuge and is now wintering with Sandhill Cranes about 70 km to the northeast. Two other birds, also colour-banded, were observed in December 1986 and January 1987 in Oklahoma but had not yet reached ANWR.

One of the latter two birds, an 8-mont old chick, was feared lost in mi November when its parents (one of whic is colour banded) arrived on the Texa refuge without it. On 30 January th chick's existence was confirmed when was observed feeding with a flock of San hill Cranes in Oklahoma (T.V. Stehn, per comm.).

CWS located 27 Whooping Crane nest in 1986 in and near WBNP. One of th nests was that of a new nesting pair, consisting of a 3-year-old and a 4-year-ol bird. Evidence of a 28th nest was obtained on 4 August when we saw a pair adult cranes (one of which was a colou banded 3-year-old) with a single chick an area where we had not previous found a nest. In addition, we had n known about one of the three Whoopin Crane families which arrived at ANW with an unbanded chick. If that family als originated from the WBNP area (as is likely), CWS biologists will have the challen ing task of finding two unknown nest site in 1987. It is clear however, that in 198 a minimum of 29 pairs of Whoopin Cranes nested.

Even though we found three new pair in 1986, the breeding population increa ed by only one pair from 1985. Two pair one of which nested only in 1984 an 1985, failed to nest in 1986. Last May w found a 9-year-old male dead near its ne and it remains to be seen if the female wil find another mate.

It is likely that the breeding populatio in 1987 will be similar to that of th previous year and may contain from 29-3 pairs. If habitat conditions in 1987 are a

Whooping Cranes *Lorne Scott*

good as those between 1984 and 1986 and if any of the 3-year-old cranes from the large 1984 class breed in 1987, there could be as many as 33 nesting pairs.

The years 1987-1990 will be exciting for crane watchers as the breeding population should grow by the recruitment of new breeders from the excellent production years of 1984, 1985 and 1986 when 15, 16 and 21 chicks, respectively, were raised in WBNP. T.V. Stehn (pers. comm.) advised that all of the 16 birds hatched in 1985 have survived to date and are present at ANWR.

After the annual removal of surplus eggs (for the Grays Lake population, see below) in May 1986, one egg remained in each of 26 nests then known to exist. Both eggs had been removed from the nest where the adult had died.

As a result of egg viability tests at nests, we knew that most, if not all of the remaining eggs were live. Six non-viable eggs were removed and in a few cases, live eggs were substituted in nests which had doubtful or non-viable eggs. Ensuring that a live egg remained in each nest in WBNP (by means of viability tests and egg substitutions) contributed greatly to the excellent hatching success in 1986 with 23 of the 26 eggs hatching. Nineteen of the 23 chicks were still alive on 10 August when a team of CWS and USFWS biologists and volunteers, supported by Parks Canada, banded 17 of the 19 chicks as well as the chick from a family discovered on 4 August. Two chicks, known to be in the Klewi River area could not be located and they remained unbanded as well as the chick from the family first seen at ANWR.

Of the 25 surplus eggs removed, 15 live eggs were placed in nests of Greater Sandhill Cranes in the Grays Lake National Wildlife Refuge in Idaho while four live eggs and six non-viable eggs were sent to the Patuxent Wildlife Research Center near Laurel, Maryland.

Although 11 of the 15 eggs hatched at Grays Lake, an extremely serious drought took a heavy toll of the Whooping Crane chicks and only two eventually feldged. Many Sandhill Crane chicks also succumbed in the area. Predators (Coyote and Red Fox) destroyed two of the Whooping Crane eggs and likely took several of the drought-weakened chicks. Two of the four live eggs shipped to the Patuxent Wildlife Research Center hatched and the juveniles are doing well. The six non-viable eggs from WBNP and four eggs which failed at Grays Lake and Patuxent were analysed by staff at Patuxent. Two Grays Lake eggs and one from Patuxent contained embryos which had died 2-5 days from hatching. Of the remaining seven non-viable eggs, two contained 10-15 day old embryos (these eggs therefore died well before the egg pick-up), four eggs did not contain a detectable embryo but were deemed to have been fertile and only one egg was infertile.

The total captive population is now about 40 birds and about 25 wild birds are believed to exist in the experimental population which annually migrates between New Mexico and Idaho and adjoining states. With the Wood Buffalo-Aransas population at 111 birds there are about 176 Whooping Cranes in the world, a vast improvement over the 21 birds in existence in 1941.

We acknowledge information provided by R.C. Drewien on the experimental population, data from T.V. Stehn on population counts at ANWR, and information provided by J.W. Carpenter on the test results of unhatched eggs carried out at the Patuxent Wildlife Research Center. Environment Canada - Parks in Fort Smith, N.W.T., provided important logistic and manpower support. We thank all these contributors.

FIRST NESTING RECORD AND STATUS OF THE CLARK'S GREBE IN CANADA

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The existence of two color phases of the Western Grebe (Aechmorphorus occidentalis) has been known for over 100 years. Although Baird referred to the light-phased birds as Podiceps clarkii as early as 1858, most ornithologists regarded them as color phases of the Western Grebe.[12 14] More recently, the two forms have been found to be reproductively isolated to a large extent and several isolating mechanisms have been identified.[8 11 9] The American Ornithologists' Union recently assigned separate species status to the light-phased birds, calling them the Clark's Grebe (Aechmorphorus clarkii).[1]

The breeding distribution of the Western Grebe extends along the Pacific Coast from northwestern Alberta and south-central British Columbia to south-central Mexico, and east to Manitoba, Minnesota and Colorado.[1] The Clark's Grebe co-exists with the Western Grebe throughout much of this range, but relative frequencies of the Clark's Grebe vary from less than 1% of the population in Canada and in eastern portions of the range, to 12-18% in Utah, and to more than 50%, occasionally up to 90%, in California and Mexico.[13 1 11 3 4 12]

In Canada, Godfrey listed the Clark's Grebe as a probable breeder in southern Manitoba, Saskatchewan and Alberta and a possible breeder in British Columbia.[5] Although summer records suggest that the species nests in Canada, no nesting evidence has been reported (W.E. Godfrey person comm.). During several years of field work on the Western Grebe in the Delta Marsh and Marshy Point regions of Manitoba during the late 1970s, Neuchterlein observed that much less than 1% of the population consisted of Clark's Grebes (pers. comm.). He observed two mixed pairs nesting at Marshy Point, one involving a Western Grebe male and a hybrid female.[9] During mid-June 1986, he observed a pair of Clark's Grebes near the end of Cook's Creek in the Delta Marsh, his first observation of a mated pair in Manitoba. The only other accepted record of the Clark's Grebe in Manitoba was a lone bird observed at Natalie Lake near Pinawa on 3 May 1986 by a large group of knowledgeable observers (R. Koes, pers. comm.).

In Saskatchewan, Clark's Grebees have been reported from three sites: five were observed among 500 nesting Western Grebes at Old Wives Lake in 1957; two were seen on 17 May - 1 June 1985 by numerous observers and one was spotted by several observers on 22 July 1986 at Wascana Marsh in Regina, and Wayne Harris (pers. comm.) has observed Clark's Grebes in a Western Grebe colony at the north end of Last Mountain Lake during several years.[10 6 7] Harris indicated that an adult Clark's Grebe with young was observed on one occasion, but its mate was not seen. Although the Clark's Grebe is considered more common in western North America, there are no definite reports for Alberta (Bruce McGillivray, pers. comm.). In British Columbia, there are two accepted records: one observed by several observers at Boundary Bay on 8 December 1986 and one seen by numerous observers and photographed (Photo #142, B.C. Prov. Museum) at Ogden Point, Victoria, on 13-26 October 1986.[2] Unofficial reports from Duck Lake in the Creston Wildlife Management Area suggest that 10% of the population is comprised of Clark's Grebes (L.S. Forbes, pers. comm.). Forbes also observed a mixed pair feeding a chick on 26 July 1983. The Western Grebe is a fairly common nesting species in large lakes and marshes of southern Manitoba. Nowhere is the species more readily observed, however, than along PTH 23 on the north shore of Pelican Lake. On several occasions during the last two years I have scanned portions of this colony attempting to locate a Clark's Grebe, without success. During 1986, nesting was delayed until late June, when the grebes finally began establishing a colony in shoreline emergents in the northwest corner of the lake. Because this site was immediately south of the town of Ninette, some residents were presented with the unique opportunity of observing Western Grebes nesting almost in their back yards — within 75 meters of their houses!

At 5:00 p.m. on 25 June 1986, Ted Grewe and myself drove to the Ninette boat launch, just west of the colony, with the intention of collecting one egg from each of ten Western Grebe nests for toxic chemical analysis. After briefly scanning the grebes outside the colony, I donned chest-waders and headed into the emergents. As I approached the colony, the first nesting grebe I saw had white extending well over the eye, and a bright orange bill. There could be no doubt it was a Clark's Grebe. I retraced my steps to get a camera and proceeded back to the colony. Upon my second approach the nesting adult was more wary, but during the next half hour I was able to get several photos of it swimming in open water near the nest (Fig. 1). During this time it chased off several Western Grebes and a second pair of Clark's Grebes that was attempting to establish a nesting territory nearby. Although I originally observed only one of the nesting adults, we observed two adult Clark's Grebes at the nest one hour later, one incubating the eggs and its mate right beside it.

The Clark's Grebe nest was located in waist-deep (90 cm) water and looked much like nearby Western Grebe nests. The structure was floating and attached to bulrushes (Scirpus spp.). The base of the nest consisted of green bulrush stems, with an inside cup of bulrushes and submergent vegetation. The clutch consisted of three uncovered and unstained eggs, hence it was believed to be incomplete. The remainder of the colony consisted of about 500 adults. There were approximately 100 Western Grebe nests with eggs and an equal number of empty nests. Most of the clutches consisted of one or two eggs, about 10 nests had three eggs and 2 had four eggs. As I walked through the colony, I saw several Grebes that looked like hybrids, but no more Clark's Grebes were observed.

During the next 2 weeks many bird watchers viewed one or more of the Clark's Grebes at this site. Harvey Lane and Dennis Fast also observed two Clark's Grebes feeding with Western Grebes in the northeast corner of the lake and a third grebe that was presumed to be a hybrid (pers. comm.). From close range through a spotting scope they noted that they hybrid-like grebe had the black and white facial margin horizontally bisecting the eye and an intermediate-colored (orangish-yellow) bill. Photos I had taken near the colony also revealed at least two intermediate-colored grebes. One resembled a Western Grebe but had a large white patch in front of each eye (Fig. 2). The second was photographed from a distance, revealing whitish lores, whitish-grey above and behind the eye, and a bill that appeared orange in comparison to nearby Western Grebes. The white in the lores of each of these birds suggests hybridization as Storer and Neuchterlein wrote "breeding adults showed a complete segregation by color phase in the color of the lores. Dark-phase birds all had dark or light gray lores."[14] Although Ratti indicated that hybridization was rare, Neuchterlein speculated that it occurs more commonly in the north where the Clark's Grebe is rare and the species-specific response to the unique

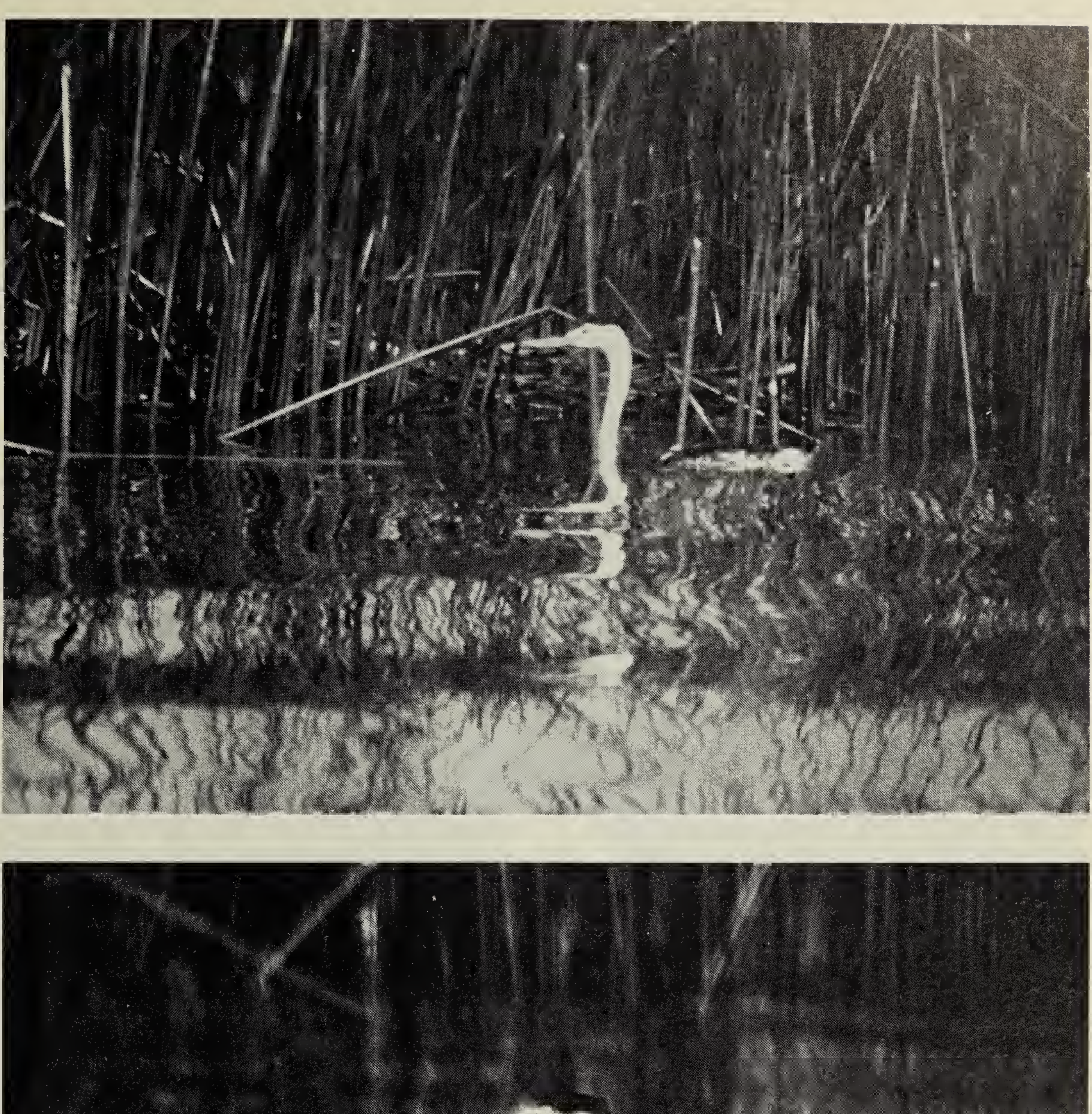

Figure 1. Clark's Grebe near nest (upper); second Clark's Grebe (lower).

Ken De Smet

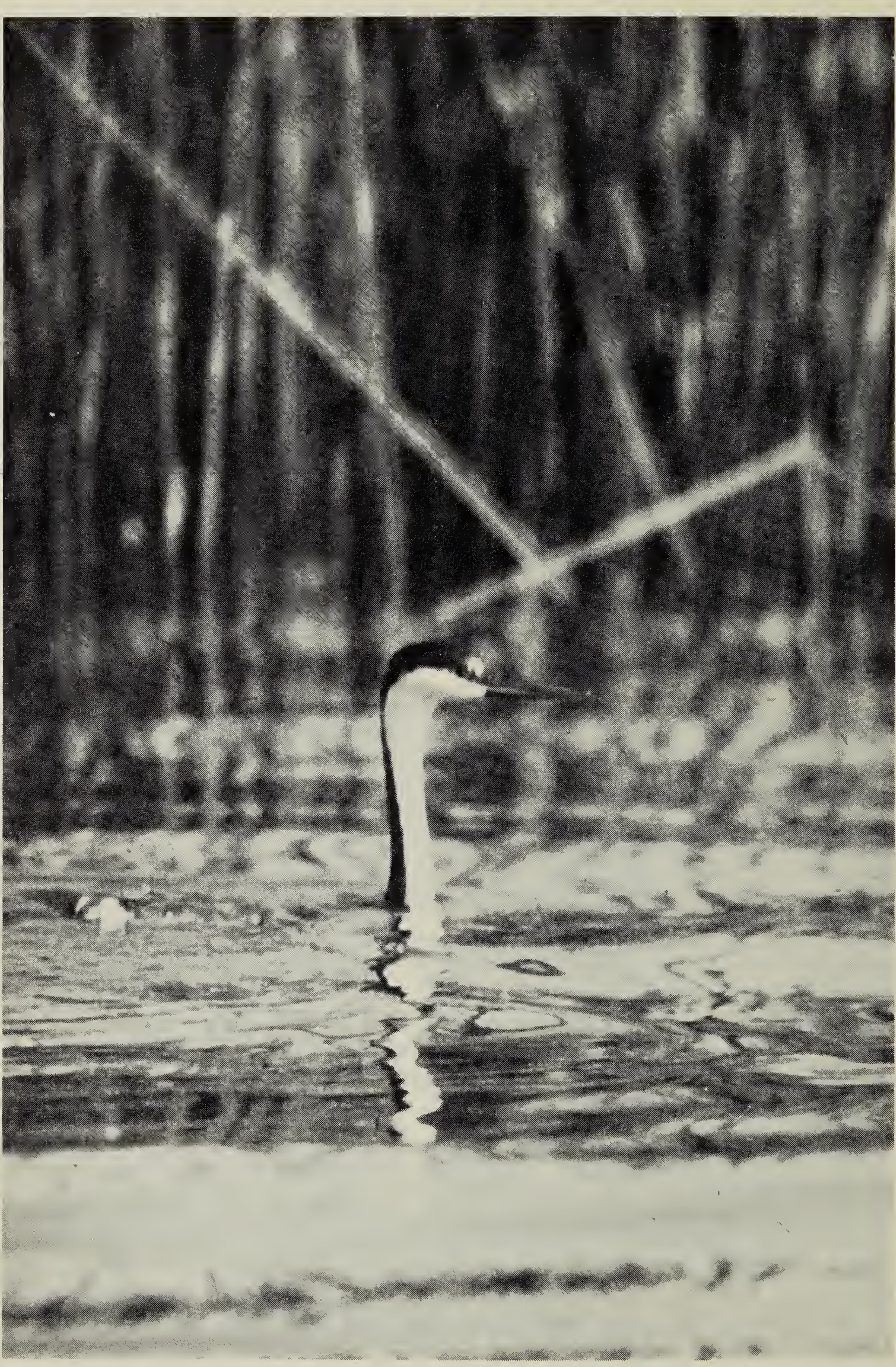

Figure 2. Hybrid Western X Clark's Grebe at Pelican Lake, Manitoba.

Ken De Smet

Advertising Call of the two species is lowered.[11] [9]

A visit to the colony on 23 July revealed that the Clark's Grebe nest was empty, the eggs presumably hatched. Eight-six nests were still active, however, including 17 with one egg, 32 with two, 25 with three, 7 with four, and 5 with five eggs. Initially, one pair of Clark's Grebes, presumably nonbreeders, was seen resting outside the colony. Although no Clark's Grebes were observed within the emergents, one was observed just outside. This bird was probably mated and nesting with a Western Grebe as both birds swam together and performed vocal duets while I conducted the nest checks.

The above information suggests that at least five Clark's Grebe adults were present at Pelican Lake during 1986. One pair nested, a second pair did not nest or was unsuccesful, and a fifth Clark's Grebe probably mated and nested with a Western Grebe. Several adults were observed that were presumed to be hybrids. Although about 1% of the Western Grebe populations at Pelican Lake, Manitoba, and Old Wives Lake, Saskatchewan were composed of Clark's Grebes when these colonies were observed, it is probable that most Western Grebe colonies in Canada, at least in the eastern portion of its range, contain much less than 1% Clark's Grebes. Western Grebe colonies throughout Canada need to be more carefully scrutinized to better understand the status and distribution of the Clark's Grebe.

[1] A.O.U. 1985. Thirty-fifth supplement to the American Ornithologists' Union check-list of North American birds. Auk 102:680-686.

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[3] DICKERMAN, R.W. 1963. The grebe Aechmophorus occidentalis clarkii as a nesting bird of the Mexican Plateau. Condor 65:66-67.

[4] DICKERMAN, R.W. 1973. Further notes on the Western Grebe in Mexico. Condor 75:131-132.

[5] GODFREY, W.E. 1986. The Birds of Canada, revised ed. National Museum of Natural Sciences, Ottawa. 595 pp.

[6] GOLLOP, J.B. 1985. The spring season: Prairie Provinces region. Am. Birds 39:315-317.

[7] GOLLOP, J.B. 1986. The nesting season: Prairie Provinces region. Am. Birds 40:1218-1219.

[8] LINDVALL, M.L. 1976. Breeding biology and pesticide PCB contamination of Western Grebe at Bear River Migratory Bird Refuge, Utah. Unpubl. M. Sc. thesis, Utah State Univ., Logan, Utah.

[9] NEUCHTERLEIN, G.L. 1981. Courtship behavior and reproductive isolation between Western Grebe color morphs. Auk 98:335-349.

[10] PALMER, R.S. 1962. Handbook of North American birds. Yale University Press, New Haven and London.

[11] RATTI, J.T. 1979. Reproductive separation and isolating mechanisms between sympatric dark- and light-phase Western Grebes. Auk 96:573-586.

[12] RATTI, J.R. 1986. Identification and distribution of Clark's Grebe. Loon 58:112-116.

[13] STORER, R.W. 1965. The color phases of the Western Grebe. Living Bird 4:59-63.

[14] STORER, R.W., and G.L. NEUCHTERLEIN. 1985. An analysis of plumage and morphological characters of the two color forms of the Western Grebe (Aechmorphorus). Auk 102:102-119.

MOURNING DOVE DISPLAY ELICITED BY A RED SQUIRREL

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Bird feeders often provide an opportunity to view wild birds and a few mammals at close range and over extended periods. Interactions between individual birds and different species occur daily; aggressive and submissive displays are a common sight. At our feeders, Red Squirrels are the dominant visitors, displacing with spirited vigor all birds and the occasional larger Grey Squirrel.

It was with some surprise, therefore, that I observed an adult Mourning Dove holding a position close to an adult Red Squirrel. This event took place on 28 May 1985 between 5:28-5:33 p.m. A patch of spilled mixed seeds on the grass beneath a feeder attached to a tree 9 m (30 feet) from our house had attracted a dove and a squirrel. When I first noticed them they were facing each other; the squirrel was feeding in the patch, the dove was off to one side about 50 cm (20 in.) away. The dove appeared reluctant to advance to feed or to leave; it was crouching down with all its feathers fluffed out, remaining still. When the squirrel advanced a few inches and sat up to gnaw on a sunflower seed in its paws, the dove briefly raised both wings to full length straight overhead and touching, an unexpected display, but it held its ground.

The squirrel advanced again to about 40 cm (16 in.), sitting up and feeding, whereupon the dove raised its right wing fully extended upwards and slightly tipped over its back to its left side. The dove occasionally pecked at the ground (displacement feeding?). The dove repeated this one-wing display, again without backing away from the squirrel. When the squirrel moved back to the base of the tree, the dove at once advanced a few inches, pecking at the ground, but not yet actually feeding. Suddenly, as if releasing nervous tension, the dove fanned out its tail feathers and raised its folded wings upward, briefly stretching hard.

Finally, the squirrel ran up the tree and away. Immediately the dove walked into the food patch and fed rapidly. A male Common Grackle that came walking by failed to move the dove, but when four House Sparrows flew off they momentarily startled the dove, which then resumed feeding.

The dove's initial posture with feathers raised and breast lowered can be identified as a component of a generalized defensive display ("including erected feathers, glaring eye, snapping bill, and low hiss") seen in many birds; it is part of an "expression of fear" seen in a "bird which for one reason or another, must stay in its place and meet the danger. . . . It is exhibited by the Mourning Dove with the usual intensity.[1] Extensive descriptions of Mourning Dove behaviour, however, give no mention of an elevated wing(s) display.[1] [2] Lack of observation of an elevated wing(s) display in the Mourning Dove suggests that this is not a regular display; certainly the close contact between a Mourning Dove and a Red Squirrel was an unusual situation. It seems likely that the observed postures of the Mourning Dove in this case arose out of a conflict of drives — an urge to flee, balanced with an urge to stay and feed.

A published account of an encounter

between a nesting Band-tailed Pigeon and a Fox Squirrel is worth relating. "Defense of the nest against a possible predator was observed on June 4, at 11:55 a.m. A fox squirrel (Sciurus niger), while crossing a tree at nest level, noticed the incubating male. The squirrel at once climbed on to a limb above the pigeon and peered down at it. Then the squirrel dropped beneath the nest and sniffed at the latter from below. Finally it climbed to the nest limb and advanced toward the pigeon. When it had almost reached the bird, the latter half-raised himself, drooped his wings and bristled the lesser wing coverts. Then, opening its bill slightly, the pigeon hissed and struck out with the bends of its wings. The squirrel at once retreated and left the tree."[3]

I wish to thank Robert E. Jones for drawing my attention to the publications on the Mourning Dove and Band-tailed Pigeon.

[1] CRAIG, W. 1911. The expressions of emotion in the pigeons. II. The Mourning Dove (Zenaidura macroura Linn.). Auk 28:398-407.

[2] JACKSON, G.L. and T.S. BASKETT. 1964. Perch-cooing and other aspects of breeding behavior of Mourning Doves. Journ. Wildl. Mgt. 28:293-307.

[3] PEETERS, H.J. 1962. Nuptial behavior of the Band-tailed Pigeon in the San Francisco Bay area. Condor 64:445-470.

Red Squirrel *Fred Lahrman*

EASTERN RANGE EXTENSION OF THE SAY'S PHOEBE INTO SOUTH-CENTRAL MANITOBA

KEN D. DESMET, Box 184, Group 550, R.R. 5, Winnipeg, Manitoba. R2C 2Z2

The breeding range of the Say's Phoebe formerly extended into southwestern Manitoba to Oak Lake and Aweme.[2] [4] [5] The only recent nesting records for Manitoba, however, are in the extreme southwestern corner of the province near Lyleton. In this area, Knapton reported up to two pairs of Say's Phoebes nesting from 1972-1977.[2] [3] Recently, three to four breeding pairs per year have been located in Lyleton and in abandoned farmhouses south and west of town (J.L. Murray, pers. comm.). This article reports on several recent sightings and a nest record of the Say's Phoebe 100 to 150 km east of Lyleton in south-central Manitoba.

While conducting the Mather Breeding Bird Survey on 15 June 1985, Wayne Neily and I heard an unfamiliar phoebe-like call at an abandoned farmyard 7 km south-southwest of Mather. Although it was dark and foggy, we managed to locate the bird, a Say's Phoebe, on a nearby fence post. After completing the survey we searched the abandoned farmhouse and a nearby grainery, but no nest was located. We did, however, briefly observe two adult Say's Phoebes. These birds were subsequently observed by several other Rare Bird Albert members in Manitoba, but neither a nest or immatures were found.

Although Knapton reported the average arrival date for southwestern Manitoba as 30 April, there were no Say's Phoebes at the Mather site on 23 May 1986.[3] On 26 and 27 June, however, Ted Grewe and I recorded two adults at this site during the Mather Breeding Bird Survey. Once again, a thorough search of the house and grainery produced no nesting evidence. After getting rained out of the original survey on 26 June, we stopped at another abandoned house 12 km southeast of Killarney. To our amazement, a pair of Say's Phoebes were there as well! This time a nest was located in a horizontal section of stove pipe. The nest contained five almost fully-feathered young. A similar-looking nest was located in a chimney ledge on the upper floor suggesting that Say's Phoebes may also have been present at this site the year before. The excited behavior of both adults differed from the unconcered manner of the Mather pair. Hence, it was suspected that the former pair may not yet have been nesting. When I revisited the Mather site on 23 July, no Say's Phoebes were observed.

On 23 July 1986, Cal Cuthbert (pers. comm.) collected additional evidence of nesting 35 kilometers east of the Mather site. On that date he observed one adult and two immatures along a fenceline 8 km north of Snowflake. The young were observed feeding themselves, but they occasionally begged for food from the adult. A nearby abandoned farmstead was believed to have been where this family had been raised.

These observations suggest that the Say's Phoebe is presently a rare breeder in extreme southwestern and south-central sections of Manitoba. Its status in the remainder of southwestern Manitoba is uncertain. Godfrey included east-central Saskatchewan in the breeding range of the Say's Phoebe, therefore the species may nest as far north as west-central Manitoba.[1]

Suitable habitat, primarily abandoned farmsteads with nearby mixed-grass prairie or pastures, throughout southwestern, south-central and west-central Manitoba should be checked for this species.

[1] GODFREY, W.E. 1986. The birds of Canada, revised edition. Nat. Museum of Natural Sciences, Ottawa. 595 pp.

[2] KNAPTON, R.W. 1977. Breeding status of the Say's Phoebe in Manitoba. Blue Jay 91:183.

[3] KNAPTON, R.W. 1979. Birds of the Gainsborough-Lyleton Region. Sask. Nat. Hist. Society, Spec. Pub. No. 10. 72 pp.

[4] LAWRENCE, A.G. 1934. Chickadee notes #588, 1 June 1934. Winnipeg Free Press, Winnipeg, Manitoba.

[5] TAVERNER, P.A. 1927. Some recent Canadian records. Auk 44:217-228.

CALL FOR ASSISTANCE: BIRD DONATIONS TO THE SASKATCHEWAN MUSEUM OF NATURAL HISTORY

As the new Curator of Ornithology at the Saskatchewan Museum of Natural History in Regina, I would like to outline the museum's present position regarding bird donations. In the past many people have played a role in building and maintaining the museum's bird collections and displays by sending specimens of birds found dead. We currently need donations of all species of birds found dead that are in good condition. One problem that we sometimes encounter is a lack of documentation with the specimens that we receive. The following information is required with specimens to make them of value for scientific study:

1) date of collection
2) location of collection
3) name, address and telephone number of collector

Prior to freezing, place the specimen in a plastic bag to prevent dehydration and include the information inside the bag with the bird. I look forward to your continued input; the value of these donations to the museum's collection cannot be overemphasized. Thank-you. — *Paul C. James*, Saskatchewan Museum of Natural History, Wascana Park, Regina, Saskatchewan. S4P 3V7

HUMMINGBIRD AND NON-FORAGING SAPSUCKER

VICTOR C. FRIESEN, P.O. Box 65, Rosthern, Saskatchewan. S0K 3R0

Two recent articles in Blue Jay described incidents involving the close association of a Ruby-throated Hummingbord with a species of woodpecker: in one the hummingbird accompanied a flying Yellow-bellied Sapsucker, and in the other the hummingbird hovered about a foraging Hairy Woodpecker.[2] [5] The descriptions prompted me to look up an entry I had made in my journal on 24 June 1971.

It is widely known that Ruby-throated Hummingbirds feed on the running sap at sapsucker diggings and probably rely on this food source in early spring before flowers are blooming and yielding nectar.[1] Therefore it is not unlikely to see hummingbirds associated with sapsuckers. My observation of 16 years ago, however, was noteworthy because of the sapsucker's own activity and of the hummingbird's continuous presence despite the non-foraging nature of this activity.

In the early 1970s each summer we had several sapsuckers about our farmyard, 5 km east of Rosthern. A row of Balsam Poplars on one side of the yard revealed series upon series of holes drilled for sap, and the birds routinely landed on the Manitoba Maples about the house and worked their way up the bare trunks in search of insects. On occasion one would flit to the ground to catch an insect. My observation concerned this bird's activities on the ground, in association with the Ruby-throated Hummingbird. It was early evening, and there was still bright sunlight.

Pough reports that sapsuckers prefer "to be near water," and Merriam in Pearson refers to the birds as "noisy, rollocking fellows."[4] [3] Both characteristics, of habitat and of voice, were evident in my observation. My journal reads as follows: "At a rut in our lane which was filled with rain-water, a sapsucker alighted to take a bath. It hopped up to the water and then bent forward, much like a human swimmer about to start swimming. It submerged almost its entire body and did submerge its whole head. When so immersed, it quivered its body and then straightened up backwards, erupting from the water where it still sat while emitting its woodpecker "laugh." Then the dipping process was repeated, ending again with the boisterous cry. The bird seemed like a mechanical toy — its pivot being its feet — for all the world like the familiar cast-iron woodpecker ornament which spears toothpicks from a holow iron log. The bird repeated its action four or five times: a bow forward, submersion, a shudder, a springing back accompanied by that "laugh."

"What added further interest to the scene was the presence of a Ruby-throated Hummingbird which had flown behind the sapsucker when it first landed for its bath. During the bird's ablutions, the hummingbird hovered above, then made frequent swoops at the bather, who in turn paid not the least attention to the little dive-bomber."

The hummingbird would have been about 0.5 m distant when hovering, while its swoops took it within a few centimetres of the sapsucker's head. The hummingbird kept up its actions until the woodpecker flew away.

It may be that the hummingbird had

previously followed sapsuckers to their diggings for the sap, as suggested by Knapton et al., and was doing so now, only the woodpecker stopped at a puddle instead of the poplars.[2] Then again, the hummingbrid, as suggested by Sealy, may have been investigating the red patch on the sapsucker's forehead, for hummingbirds are attracted to red coloring.[5] It was during this same time period that I was raising Scarlet Runner Beans in the vegetable garden alongside the lane, and these plants with their red blossoms were much visited by hummingbirds.

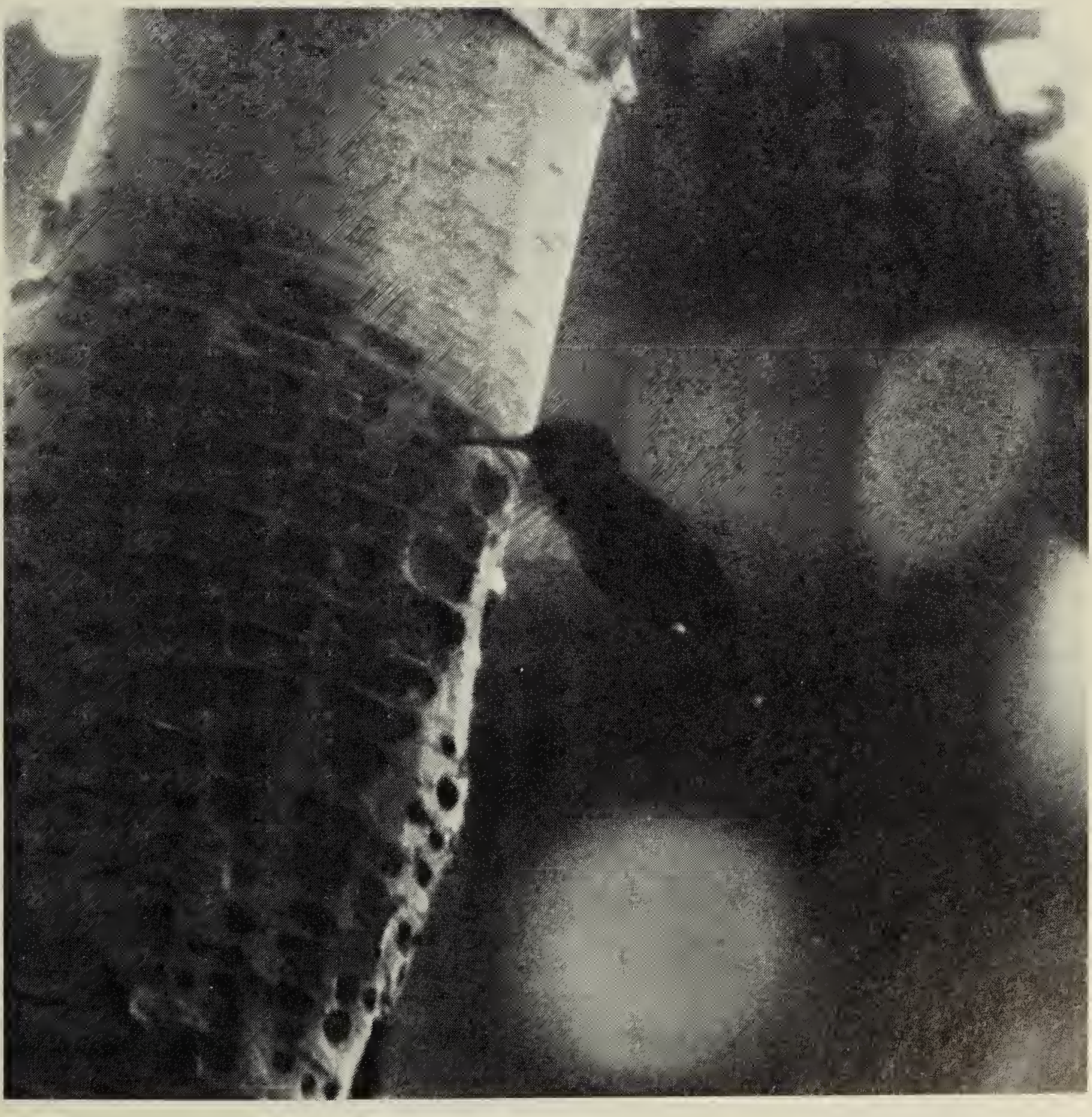
[1] DENNIS, J.V. 1981. Beyond the bird feeder. A.A. Knopf, New York, 201 pp.

[2] KNAPTON, R.W., R.V. CARTAR and J.D. REYNOLDS. 1985. Do hummingbirds follow sapsuckers to food sources? Blue Jay 43:186-187.

[3] PEARSON, T.G. et al. 1936. Birds of America. Garden City Books, Garden City, N.Y. 3 Vol.:272 pp., 271 pp., 289 pp.

[4] POUGH, R.H. 1949. Audubon bird guide. Doubleday, Garden City, N.Y. 312 pp.

[5] SEALY, S.G. 1986. Ruby-throated Hummingbirds associating with a foraging Hairy Woodpecker. Blue Jay 44:241-242.



Ruby-throated Hummingbird at Emma Lake, Saskatchewan. *Anonymous*

UNUSUAL NESTING SITE FOR BANK SWALLOWS

GERRY A. WILDE, 276 Collinge Road, Hinton, Alberta. T0E 1B0

On 5 June 1986, in the Hinton, Alberta area a number of Bank Swallows were observed concentrated around an old sawmill site (53o 16′ N 117o 43′W). Closer observation revealed that they had selected the sawdust pile as an alternative to their normal nesting sites. The vertical section of the sawdust pile is approximately 3-4 metres high and faces northwest. There were about 100 tunnels of which 20 appeared to be occupied. Although there are several other sawdust piles in this area swallow activity had not been observed at them. Godfrey, Harrison and Salt and Salt do not mention sawdust piles as potential nesting sites, however Bent reports two incidents in 1902, one in New Hampshire and the other in Michigan.[2][3][4][1]

The birds may have selected this site over other more natural ones and over other sawdust piles in the area for several reasons: 1) The size of the material facilitated excavation; 2) The vertical face was created by the removal of part of the sawdust pile; 3) The age of the pile and the stage of decomposition of the sawdust provided a very stable medium for the birds.

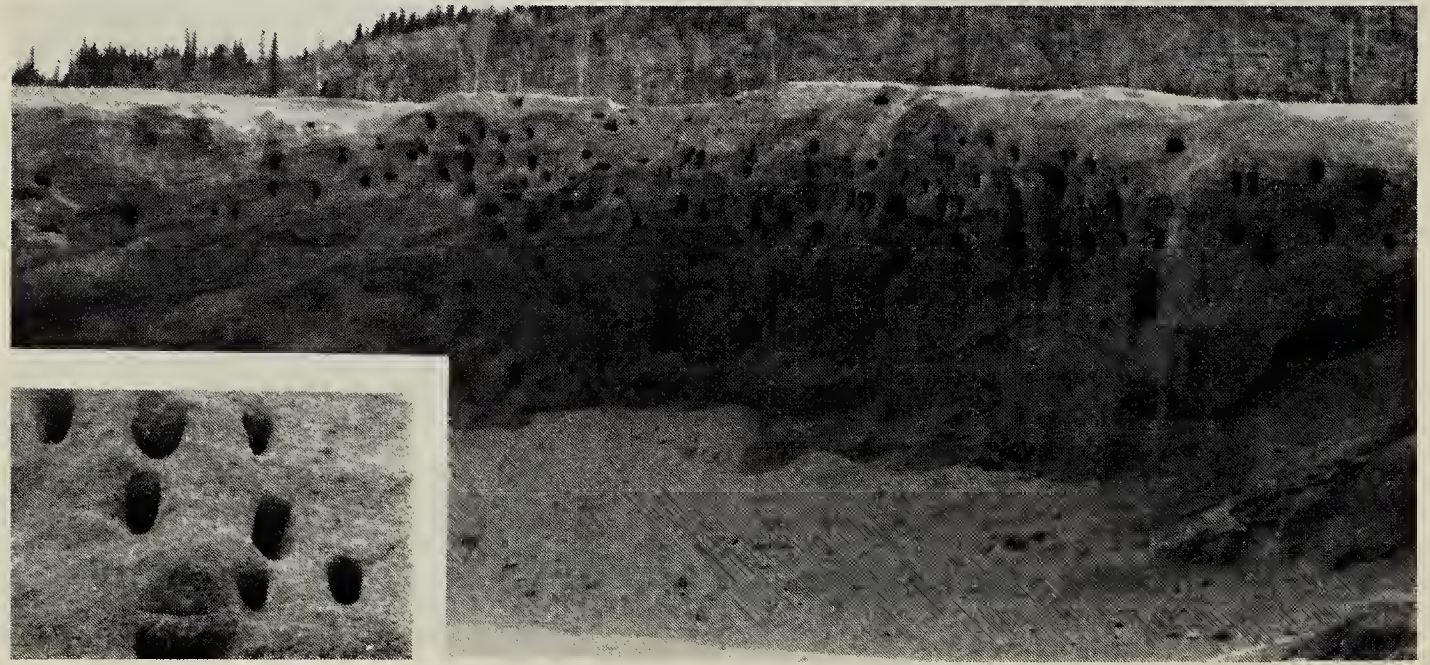
The nests were not checked for fear of disturbing the birds, however on 6 October 1986, I returned to photograph the site and it appeared that the vertical portion was stable and had withstood the very strong chinook winds in this area. I believe the birds will return to this site next year.

[1] BENT, A.C. 1963. Life histories of North American flycatchers, larks, swallows, and their allies. Dover, New York.

[2] GODFREY, W.E. 1966. The birds of Canada. Bull. No. 203, Biol. Ser. No. 73. Nat. Mus. of Canada, Ottawa.

[3] HARRISON, H.H. 1979. A field guide to western bird's nests. Houghton Mifflin, Boston.

[4] SALT, W.R. and J.R. SALT. 1976. The birds of Alberta. Hurtig, Edmonton.



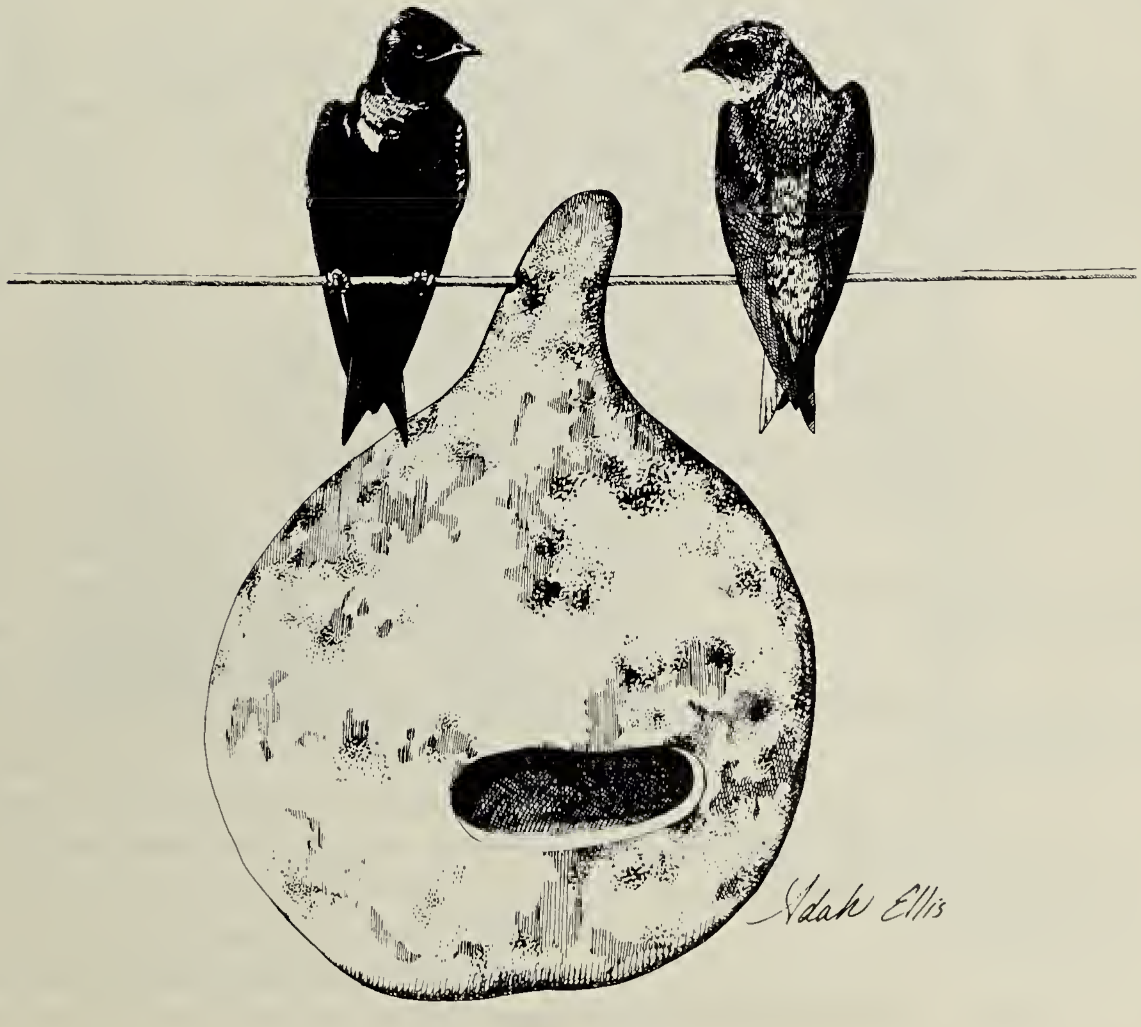
Bank Swallow nests in sawdust pile. *Kendall Collett*

PURPLE MARTIN CONSERVATION ASSOCIATION

The Purple Martin is a bird which has been managed by man longer than any other North American bird species. Even before European man colonized the New World, native American indians were enticing these companionable birds to nest in their villages by attaching hollowed-out gourd "nest boxes" to the support poles of their wigwams. Modern man has continued this gourd-using tradition to attract martins, but he also has taken to using elaborate wooden, plastic, or aluminum multi-compartmented bird condos (i.e. "martin houses") which he mounts on poles and proudly displays on his lawns.

Today however, this man-dependant species is declining within parts of its breeding range. In an attempt to remedy the situation, the *Purple Martin Conservation Association* has been formed to help coordinate the management efforts of North America's martin landlords. Through its *Colony Registry Program* it is attempting to locate and register most of the martin colonies in North America in preparation for several worthwhile projects, including a continent-wide nest-record card scheme.

If you know of someone who has a martin colony or is trying to attract one, or if you are interested in starting a colony yourself, please write to the P.M.C.A. You can further assist by looking for martin houses or gourds in peoples' yards during your travels. If you locate some, please try to obtain the mailing addresses from either the street & house numbers, rural mailboxes, phone books, or by stopping to inquire. Please send addresses to: P.M.C.A., P.O. Box 178, Edinboro, PA 16412.



PRONGHORN HABITAT USE IN ALBERTA

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This information was collected on the side during the course of a masters thesis study conducted on the effect of burning on pronghorn range use in Alberta.[4] The Suffield Military Reserve, north of Medicine Hat, was chosen as the site for this study because it offered the combination of frequent large grass fires, a good pronghorn population and a large uncultivated area (2560 km^2). The data was collected from 11 July 1985 to 28 June 1986 on a total of 8,423 pronghorn sightings.

The habitat that a pronghorn was seen in was recorded for each individual censused. Habitat use was originally recorded for 16 habitat categories but these were later lumped into 7 broad categories as follows:

Burned Range — all range burned during the study and distinguishable from unburned range except in May and June when mapped pronghorn locations were used to determine the use of burns.

Roadside — roads, roadside ditches, small trails, tank tracks, etc., generally any mechanically disturbed site.

Grassland — upland areas with no strong shrub component.

Sage Grassland — grassland with a strong sage component.

Slough — areas containing water, at least in the spring and characterized by marsh vegetation.

Shrub Grassland — grassland dominated by other shrub species besides sage.

Wet Grassland — grassland on slightly moister sites such as small depressions and hillside ravines and characterized by thicker and taller vegetation than grassland.

These habitat types were qualitative and not based on any analytical methos. No mapping of habitat types was undertaken, so there is no analysis of whether habitats were used more or less than expected except for burned range. Range burned in July and August 1985 was used significantly more than expected, based on its area, in September, October, November, January and April.[4]

There was a noticeable seasonality of use of the various habitat types (Fig. 1). All habitat types, with the possible exception of shrub grassland, underwent large fluctuations in use.

July, and to a lesser extent August, were drought periods during the study. During that period sloughs and roadsides were heavily used by pronghorns. Other habitat types were less important. At that time of the year these were the only habitats with green vegetation. Even sage and other shrubs (which were also green) failed to attract pronghorns to the same extent during these months, perhaps due to higher levels of plant toxins. Similarly, McNaughton found that high grazing intensities occurred on green forage during the dry season when green forage was rare in the Serengeti.[9] Presumably this green vegetation in sloughs and roadsides was higher in nutritional quality than the dried vegetation on the other habitat types. For

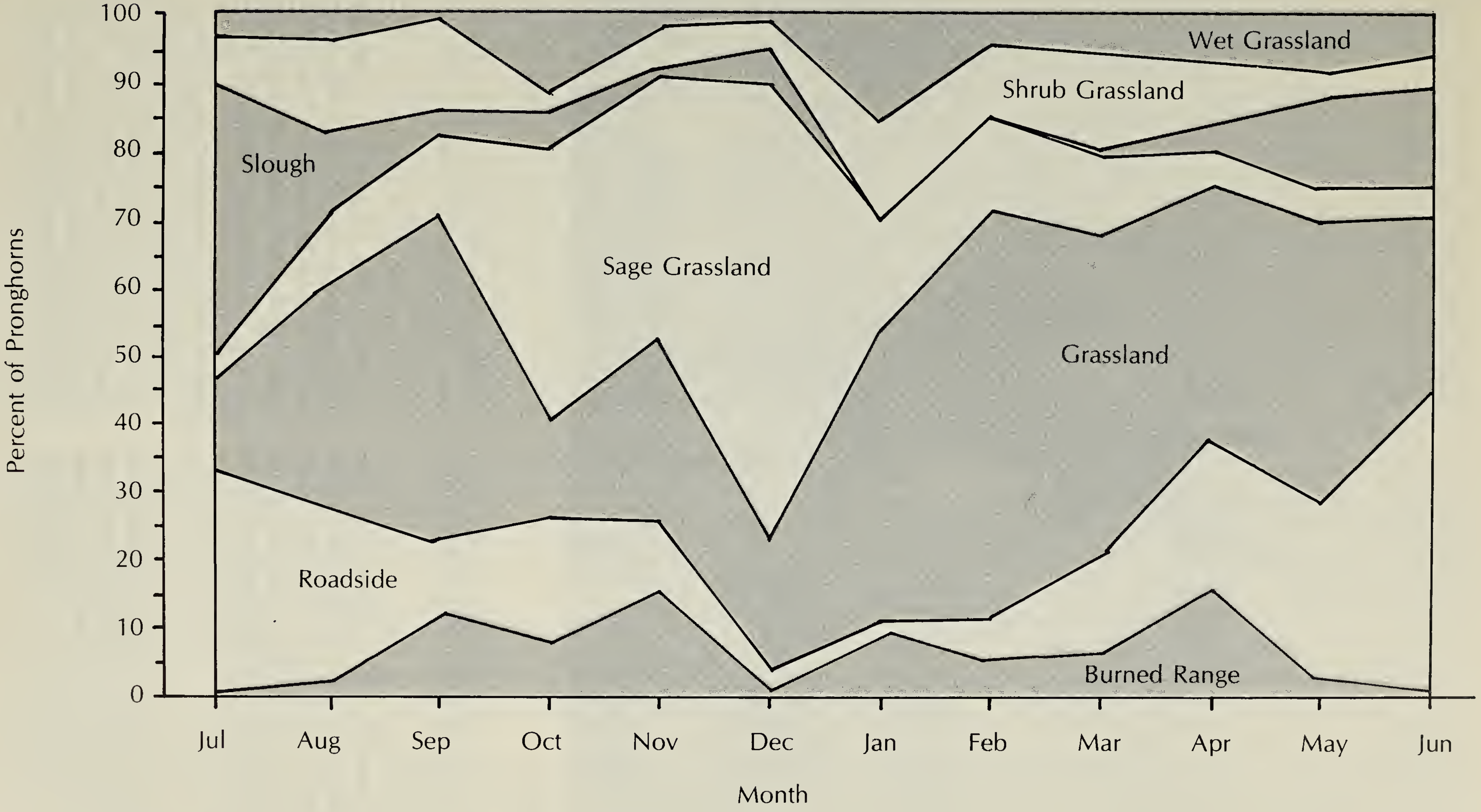

Figure 1. *The percent of pronghorns on various habitat types by month.*

Pronghorn *Chris Adam*

management purposes these areas seem to be important summer drought habitat for pronghorn.

By September the drought had broken and there was a cool, wet fall through to November. Generally all habitat types greened-up during this time. Burns and sage grassland were used more and the drought habitats of July were used less.

December was the only month with a continuous snow cover. During this month sage grassland was by far the most important habitat and the use of all other habitats decreased or remained at low levels. This is consistent with what other workers have found for northern pronghorn populations in normal winters.[1 3 6 8]

January through March were very mild winter months with no snow that stayed for more than a few days. Pronghorn tended to move back out onto the open prairie (grassland) and away from their winter range. This is also consistent with the findings of others.[2 7]

April was the beginning of spring green-up and trends that began in April continued into May and June. The sloughs again became important, but not as during the 1985 drought. Roadsides became even more important, perhaps due to increased quantities of forbs from the higher 1986 rainfall. The use of other habitats remained relatively constant.

For pronghorn management purposes, the habitats used under stressful environmental conditions such as drought in summer, and extreme cold and heavy snow cover in winter are the important ones. Sloughs and roadsides are important during droughts. Sage is important in fall, when pronghorns, especially the males after the late September rut, are accumulating fat for the winter. Sage is also important during the winter, probably due to its high nutritional quality and availability at that time of year.

More information is needed on habitat use in relation to habitat availability. For example, is the use of the shrub grassland greater than expected based on its area? To date, most pronghorn management emphasis has been placed on sage, to the detriment of other winter habitat types. Sage was far more common than any other shrub and its use may simply be related to its availability.[5]

Pronghorn used a variety of habitat types in varying proportions throughout the year. range should be managed to maintain this diversity. The diversity of habitat types will benefit other wildlife as well. Diversity is an important consideration when planning the reclamation of strip-mined rangelands or the designation of natural areas for wildlife conservation.

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1987 SNHS TOURS

Series of Nature Tours is currently being organized for 1987. Planned destinations include: Dinosaur Museum at Drumheller, Alta. (Aug); Hudson Bay Botany Tour (July 31-Aug. 3); Grey Owl's Cabin at Prince Albert National Park (Aug. 8); Whooping Crane Tour from Saskatoon (Oct. 4).

For further information about these tours write to: **Stan Shadick, 3F - 1800 Main Street, Saskatoon, Saskatchewan. S7H 4B3.**

NATURE LIBRARY

BIRDS WORTH WATCHING

GEORGE MIKSCH SUTTON. 1986. University of Oklahoma Press, Publishing Division of the University, Morman. Forward by Olin Sewall Pettingill, Jr. 207 pp., 60 color photos. Hardcover $

This book is a tribute to George Sutton's keen eye for detail and his enjoyment in bird watching. His meticulous note-keeping made it possible for the book to be completed some years after his death in 1982. Sutton's love for birds and their importance to us all is made very clear by his writings. He describes the joy he felt in 1901, at the age of three, when being entertained by a Ruffed Grouse drumming on the window sill of his family's cabin near Aitkin, Minnesota. Truly an amazing age to start "watching" birds.

The book consists of accounts of 60 bird species, each accompanied by a photograph. These species represent 12 major groups or orders. Some of these species are well known in our part of Canada, while others are indigenous to the southern United States. Many of us will only dream of seeing some of these southern species, but through his vivid descriptions, Sutton brings them a little closer to us all. Not only does the author relate his own intimate contact with these birds in the Oklahoma area, but he also describes the birds' courtship, nesting, molting, migratory patterns and general behavior so we can understand more about the species. It is obvious that the author has a great deal of knowledge of bird behavior. He does not hesitate, however, to end each of his species accounts with a question about some aspect of the bird's life, expressing the need for more studies of individual bird species. For example, Sutton asks some questions regarding the Brown-headed Cowbird that possibly many of us have also asked: "How did social parasitism come to pass? Was the ancestral cowbird orthodox in its nesting?"

The photographs are of very high quality. Taken by several different photographers, they not only depict the bird in its natural habitat but also show some behavior characteristic of that particular species.

While reading this book I could not help comparing George Sutton to a well-known Saskatchewan bird watcher, the late Manley Callin. Many of Sutton's detailed bird observations were made during his trips to and from his work at the University of Oklahoma. Callin also made many of his observations while travelling to and from work. In the forward to Sutton's book Olin Sewall Pettingill Jr. describes Sutton's perceptions as being infectious, sharpening his own senses. George Sutton influenced his many students at the University of Oklahoma, just as Manley Callin influenced me and others of his friends. The detail I saw in Callin's note-keeping helps me to understand George Sutton's attention to detail.

I recommend *Birds Worth Watching* to anyone who is interested in bird observation. It is an excellent reflection of the personality of Sutton and is a good introduction to his 14 other books. My only criticism of this book is that there are accounts of only 60 species. I am sure Sutton had a difficult time selecting these species and that he believed that all birds are "worth watching." — Reviewed by *Don Weidl*, Box 607, Birch Hills, Saskatchewan. S0J 0G0

MAMMALS IN NORTH AMERICA

Wildlife Adventures Stories and Technical Guide

Robert E. Wrigley. Wildlife Paintings by Dwayne Harty 1986. 21 x 28 cm. Hyperion Press Ltd., Winnipeg. 360 pp.

Have you ever wondered if beavers get hit by falling trees, if squirrels lose their footing, or how porcupines copulate? Dr. Wrigley may not answer all your questions about mammals, but he does present some fascinating information in this readable, descriptive volume. For example he tells us that "The arctic fox makes the most extensive journeys of any land mammal in the whole world." In reference to the Cougar he says: "The cat is capable of incredible physical feats, covering 13.7 m (45 ft.) in one bound, leaping 5.5 m (18 ft.) into a tree, and 3.7 m (12.1 ft.) vertically while carrying a deer carcass in its jaws." He shares this about the Masked Shrew: "A heart rate up to 1,200 beats per minute has been recorded."

This book deals with 115 species of mammals in an attractive format. The introduction to the book gives the reader a brief overview of the world biomes, accompanied by maps and illustrations. I do not know upon what basis they were chosen, but several animals represent each biome. After a general forward for each of the 11 biomes, a short story tells what daily life, at any given time of the year, is like for these warm-blooded creatures. An adjacent page of small print offers technical data: the common and scientific names, the family and order, length and weight, colour, distribution and status, food, and reproduction and growth. All measures are in imperial and metric. The remarks at the end add an interesting personal touch so that you do not get the feeling that you are reading a textbook. The end of the book has a well-designed checklist of North American mammals, followed by an extensive "Additional Reading" list.

Along with the data, there are large well defined maps showing the distribution of each mammal. Occasionally there is confusion as one tries to match up the text information with the map. The maps could have also offered migration routes or areas of population densities.

I found myself always wanting to read the story first and the fact sheet later. The story usually left me hungry to know more, such as this last line: "The famed population explosion of lemmings had begun, and the whole tundra community of plants and animals would be affected." In each story there was good interconnection with other animals mentioned in the book. In a story about the arctic hare, for example, we read: "A lone white arctic wolf, who had gone without eating for three weeks, caught the hares' scent from over a kilometre away."

There is no dead time in this book. Every sentence contributes not only to knowledge about a particular animal, but also to the understanding of the cycle of life. "Later its soft tissues provided food for an arctic fox and insects. The following summers the mountain avens grew stronger and produced dozens of flowers, fertilized by the last remains of the wolverine." This ability to see nature as a whole is part of Wrigley's strength, and he alternates the use of minute detail with his articulation of general concepts.

Ninety-eight full-page paintings create a book that appeals to a wide age range and level of interest. Ironically, the verbal descriptions are so good that some of the pictures are lifeless in comparison, for example the paintings of the White Whale, Pronghorn and River Otter. However several paintings enhance the word pictures and give a strong feeling for the habitat. These include the Sperm Whale, Western Harvest Mouse and

Striped Skunk. When Wrigley says about Mountain Sheep: "These stocky animals are heavy but sure-footed, with independently moveable sections of the hoof, each backed by a rubbery pad and a scent gland in between," I long to see a small line drawing of it to help me understand this. At other times I want to see tracks or close-ups of unique features. Such illustrations would have been an asset. Unfortunately too, colour often reproduces poorly and reproductions are always different from the originals in colour and texture. If you compare the Ringtail that graces the cover, with the Ring-tail inside, you will find some discrepancy.

Mammals in North America can be easily understood by the lay person, and may serve as a stepping stone to deeper study. The scientist will find it a good quick reference. It is written concisely while still allowing for personality. The paintings are accurate, fairly charming and sometimes even exciting. It is not "yet another book" as I first thought. It is special because as the author states, it has "entered the daily lives of animals." — Reviewed by *Colleen Gerwing*, 3-510 11th Street East, Saskatoon, Saskatchewan. S7N 0G2

HAMILTON MACK LAING, HUNTER-NATURALIST

RICHARD MACKIE. 1985. Sono Nis Press, 1745 Blanshard St., Victoria, B.C. 234 pp. Hardcover. $19.95.

Mack Laing became a hunter at the age of 11 in 1894 on a pioneer farm at Clearsprings, Manitoba. Unlike many other boys, he learned the habits of the birds and mammals he snared, trapped and shot. After attending collegiate in Winnipeg, he took four months of teacher's training and at age 17 began six years of teaching in rural schools. He commenced a nature diary that year and learned taxidermy.

In 1908, after another year at normal school, he became principal of the school in Oak Lake. Here he started one of the first boy scout troops in Canada; the late Dr. D.A.D. Wright of Nipawin was one of his pupils and scouts. Spare time was spent in nature study. His book, *Out with the Birds*, was published in New York in 1913; a reviewer for the New York Nation called this an "uncommonly good book." In June 1911 he gave up teaching and enrolled in a four-year art course at the Pratt Institute, Brooklyn, New York.

Every summer he returned to his camp at Oak Lake. In spite of his art training (reproductions in this book show that he achieved competence), Laing eked out his living by writing for magazines such as *Recreation, Sunset*, and *Canadian Magazine*. After serving a year in the Royal Flying Corps, Laing turned to newspapers and published about 150 articles in the *Toronto Globe* and over 400 in the *Manitoba Free Press*, although two were published in *Scientific American*.

In 1920, he accompanied Francis Harper and Alden Loring on a seven-month Smithsonian collecting expedition, canoeing down the Athabasca River from Fort McMurray to Lake Athabasca. His second collecting experience in Saskatchewan followed the next year when he accompanied P.A. Taverner to Cypress Lake and Eastend before going on to his old stamping grounds at Oak Lake, Manitoba. In 1922 he was assistant ornithologist with the National Museum of Canada's field party in the Okanagan Valley and at Comox on Vancouver Island. In October 1922 he bought a five-acre lot near Comox where he and Taverner had camped all summer, and spent a year clearing the land and building his house. In 1924 he was naturalist with the *HMCS Thiepval* expedition to Japan. In 1925 he was naturalist on the Canadian Alpine Club's Mount Logan expedition.

After an 11-year courtship and a five-year engagement, Laing married in 1927 and brought his bride from Oregon. The two of them turned his lot into the Bay Brook Nut Farm and Market Garden, though he supplemented his income as a freelance writer and summer collector for museums.

In 1930 he was the first Canadian park naturalist ever hired, working at both Jasper and Banff National Parks. That summer his wife Ethel was hired as a cook and his student assistant was Ian McTaggart Cowan. When the depression in 1931 abolished the naturalist position, the Laings lived on the proceeds of their fruit trees and 866 nut trees.

In the summer of 1934 he collected on Vancouver Island with a Carnegie Museum party led by George Miksch Sutton and John B. Semple. From 1935 through 1939 he again collected for the National Museum in British Columbia, training Charles Guiguet from Shaunavon, Saskatchewan, who later became curator at the British Columbia Provincial Museum. Thousands of Laing's specimens of birds, mammals and plants remain in our museums. One plant, (*Antennaria laingii*), a subspecies of the Marsh Wren (*Cisthothorus palustris laingi*) and a Pocket Mouse (*Perognathus parvus laingi*) were named for Laing. He was also one of the first to be concerned with what is now called acid rain, writing about the "blight of the poison gas from the Trail Smelter that has killed and left the blanched skeleton of the forest at its feet." As a new generation of naturalists grew up who used binoculars and field guides instead of the gun, Laing's views on predators became outdated and earned him more enemies than friends. Although he ceased writing articles, his fine biography of his friend Alan Brooks, who shared his philosophy, was published by the British Columbia Provincial Museum when Laing was 96 years old. Manuscripts for 13 other books remain unpublished. Laing remained hale and hearty, gardening and writing long, interesting letters when in his 90s. He died as he was about to enter his 100th year. We are in debt to Richard Mackie for his careful research, reviewing and listing large numbers of unpublished archival letters and manuscripts. Clearly not an ornithologist himself, and not fully cognizant of Laing's contemporaries, particularly Ernest Thompson Seton, Mackie has made only a few errors of fact and interpretation, as well as several omissions. For example, I wish Mackie had pinpointed the site of Clearsprings (two miles north of present Steinbach, Manitoba), and had given the exact dates of Laing's birth and death, both of which occurred in February.

This worthwhile and readable book is illustrated by a fine collection of 65 photos and 14 of Laing's paintings and is reasonably priced. It helps one to appreciate a pioneer naturalist who made important collections in Saskatchewan and southwestern Manitoba. — Reviewed by *C. Stuart Houston*, 863 University Drive, Saskatoon, Saskatchewan S7N OJ8.

THE MULBERRY TREE

ANNA FRIESEN and VICTOR CARL FRIESEN. 1985. Queenston House Publishing Co. Ltd. Winnipeg, Manitoba. 206 pp., softcover $9.95, hardcover $19.95.

As Victor Friesen has pointed out this book is a "pioneer reminiscence," but nature plays an integral role in the development of Anna, the main character, from childhood to adolescence. The title indicates the book's ties to the natural world, as do the section headings: "A Twig is Bent," "Green Leaves and Yellow," "The Branches are Bare" and "Blossoms." References are made throughout the book to the changing seasons, as well as the various flora and fauna associated with each season.

The setting is near Rosthern, Saskatchewan (North West Territories at that time) in the early part of the twentieth century. The book chronicles the early life of Anna Friesen, Victor's mother, and her family, who homesteaded in the Rosthern area. It is at once an account of and tribute to his Mennonite heritage and the sturdy pioneers it bred.

Anna was the first of her parents' children born in Canada, after they left Minnesota for the North West Territories and the homestead opportunities they offered. Because of her status as their fist Canadian-born daughter, Anna was a special source of pride to her parents, particularly her father, who was characterized as a robust adventurer who "became an adult with mixed feelings." Her mother on the other hand, was the solid foundation on which the family was built, quietly enduring years of hardship, endless toil and childbearing and rearing. Indeed, her mother emerges as the true heroine of this book; her role was that of the typically unsung Mennonite mother and housewife, without whom few pioneer families could survive.

The story is a nostalgic look at Anna Friesen's past and the difficult, though rewarding years in a harsh climate and on sometimes uncooperative soil. As an outdoorsman, Anna's father chose a farm with a lake; since it was chosen in winter, he could have no idea that by spring his prized lake would become an alkaline slough. Told with a good deal of acceptance and good humour, Anna's story is one of the triumph of a family's love and willingness to work together over difficulties such as poverty, cramped quarters, back-breaking labour and the omnipotent weather.

Included in the book is a recipe section which provides instructions for several traditional (and delicious!) Mennonite dishes. In addition, and entire chapter is devoted to the foods prepared and enjoyed by the Mennonite pioneers. Central to their survival was the ability to use what they had at hand — wild fruits, abundant garden vegetables, milk and cream. Much of a pioneer woman's time was devoted to the preparation of food, for without sustenance, hard work, the foundation stone of this province, became impossible.

Their lives, like their foods, were simple; their basic needs were satisfied and they asked for little else. Without our modern conveniences, life revolved around the changing seasons - the passing of yet another impossible winter to a spring ripe with the promise of plentiful harvest; golden hot summers which give way to the hubbub of the harvest.

This book's triumph is the analogy of the mulberry tree's growth with the progress of Anna and her family. The continual reference to the mulberry bush, her father's fond memory of his former home in Minnesota, parallels the healthy growth of a new family in a new land.

This is a simple, refreshing account of one woman's childhood prairie experience. It is an experience shared, however, by many and for that reason it holds a historical significance for those of us with roots in Saskatchewan. This is also my own grandmother's story in that it is a common reminiscence of a robust rustic life. Bad memories have been set aside and what shines through is the courage and unfailing determination of a hardworking, contented people. — Reviewed by *Terry Toews*, Box 607, Birch Hills, Saskatchewan. S0J 0G0

LETTERS

AN OWL BANDING TRIP IN 1986

WENDY LYON, 765 Horace Street, Regina, Saskatchewan. S4T 5K7

On 8 June 1986 Lloyd Saul and I accompanied Wayne, Anne and Val Harris and Sheila Lamont on what was my first owl banding excursion near Raymore, Saskatchewan.

The first stop of the day was a Great Horned Owl nest located in a large old barn. After searching the loft carefully we realized that the young had already left their nest on top of the bales, so we turned our attention to the nearby hedgerow. The three young owls were roosting in the trees. When they flushed, two flapped along the outer edge of the hedgerow while the third opted for the summerfallow. Although it did not appear to fly well on its own, with the help of a very strong southerly wind it was capable of gliding for a long distance across the field. The girls set off across the summerfallow, trying to keep the owl in sight as it soared along close to the ground. Eventually it had to land, and after turning to face into the wind, it sat crouched low, wings spread and beak clacking in an attempt to look menacing. We cautiously approached, with Sheila circling behind, but just before she reached it the owl pushed off and was swept away again by the wind.

Several unsuccessful attempts took us across nearly a mile of dusty, black soil. We were ready to give up but realized that the young bird might not be able to return to where its parents were still feeding it. Finally our attempts at circling the owlet confused it long enough to enable us to catch it. The young owl was returned to the farmstead where it was banded and released with the two others which the men had been successful in catching.

The young were banded in several Great Horned Owl nests and one of Short-eared Owls. The real highlight of the day came from a Great Horned Owl nest located a quarter mile north of Semans. In the nest, in addition to the usual array of dead mice and such, we found the unidentifiable remains of a small hawk, with a band on it!

I sent the band away and finally received a reply that the unidentified hawk was a Merlin. It had been banded on 23 June 1985 before it could fly, by Adam Schmidt at Homefield, Saskatchewan, just north of Ituna. After learning of the find Adam reported that the nest had been used consecutively for 5 years, and had raised young each time. Although the Merlin wasn't an exotic visitor from afar, it was no less exciting to learn about it's home, particularly since it was Adam's first return.

OWL CALLS

I write with regard to the article by C.S. HOUSTON, C.J. ESCOTT and R.C. GODWIN, The Great Gray Owls that weren't. (Blue Jay 40:164-165).

On 11 June 1985 we were canoeing on the Wisconsin River just below the dam at the Wisconsin Dells, Wisconsin, U.S.A., when we saw one adult and two immature Great Horned Owls on the east bank of the river in Columbia County. This was between 0700 and 0730 h Central time. The owlets were giving single, somewhat shrill, ascending shrieks that reminded us most closely of the food-begging call of the Siberian Crane chick (downy young and juvenile, which we grant is impossible to hear on this continent except at the International Crane Foundation, Baraboo, Wisconsin, where both of us were employed).

The adult flew up the cliffy bank away from us and the two fledglings followed in jerky short hops or flights from branch to branch and tree to tree until the activity subsided and we could see them no more.

Although notable, we did not find the vocalization remarkable. We have not heard it since, as we've had no more encounters with Great Horned owlets. After 1.5 years we've listened to Peterson's *Field guide to the western birds* tape to compare our memories with the Great Gray Owl juvenile food begging call and although we concede to our memory that the Siberian Crane chick call best compares with what we heard, the Great Gray Owl juvenile call on the tape is of a very similar nature.

Scott heard the same vocalization described above from a fledgling Great Horned Owl in September 1983 near Briggsville, Wisconsin (Marquette County). This owl was alternately calling and then flying around to try its wings. It was not a proficient flyer and must have hatched later in the year than normal for this species in our area. — *Scott and Ann Swengel*, 315 4th Avenue, Baraboo, Wisconsin, U.S.A. 53913

BLACK-BILLED MAGPIES

Although Black-billed Magpies are regular and common as far north as Prince Albert National Park, I had not encountered one north of there until 1984 when a pair was observed at Weyakwin Lake, 60 miles south of La Ronge. In 1985 the species was again observed at Weyakwin.

In September 1986 a single magpie was observed at La Ronge, the first I have seen in 15 years of residency here. Two were seen during my Christmas bird count on 26 December. Perhaps this represents a range extension. —*Jim Paul*, Box 205, La Ronge, Saskatchewan. S0J 1L0

EDITOR'S NOTE: There are more northerly records of presumed stragglers such as one at the Lorado refuse dump at Beaverlodge Lake near Lake Athabasca for 3 weeks in November 1957 (Heaslip 1959), one at Stony Rapids on 15 July 1963 by Anweiler (Audubon Field Notes 17:468, 1963 and Nero 1967) and one at Black Lake daily through February 1964 by Mrs. Arnold Morberg (Nero 1967).

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